Rev. Jan 31 1865
Ans Jan 31

Hochgeehrter Herr Doktor!

Herr Professor Alex. Braun hat mir
meinen Wunsch freundlich gewährt mir
Ihnen ein ihm gehöriges Briefe aus
interessanten botanischen Mitteilungen
mir sowie zur Ansicht mitzuteilen, und
die äußerordentlich interessanten Notizen,
welche sich darin finden, sogar mir sehr
bereitwillig recht viel Mühe
und die Schönheit bildung einzelne seiner
Notizen namentlich die Normalität der
Anschauung für einen klaren Journal
äußerst kundzugeben scheint, in welcher
ist in kürzester Zeit nur zwei Bogen und
dreißigmaliger Größe erscheinen
freundlichgestattet und auf diesen einzelnen
Manuskripte ein Exemplar geben würde.
Ich wurde mir diese Benützung nicht gern
verweigern oder gar die Ihnen angehörige
seiner selbstverständlich auch öffentlich
auf Benutzung machte werden, ohne ich
die Ihre Mitteilung verbunden.

Ich sehe die Abhandlung, der Verfasser
die neuesten Literatur, sowie die
neue ungemein viele freundschaftliche
Beweise, und der Umstand ohne mir
vorbehalten die Abhandlung für einige der
besprochenen Species vorläufige Namen

GEORGE ENGELMANN PAPERS MISSOURI BOTANICAL GARDEN

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Ich Bruce mitgetheilt. Vorgestern
habe ich für C. Engelhardtiana Anf-
nahme als Beweis an C. Nuttallii
gesandt; ich sehe an allen Formen für
Prozelles äußerst für sehr in Abfall
kommt und verändert besser und schon
gegründet endlich auf uns in ausgiebigen
Feuchtigkeit gestern Sollmündungen
gepflanzt und C. Nuttallii auf
gegangen. Respektiven Abstammung und
der Zeichnungen die ich auf Wunsch
Ihnen ich Stücke Fruchtbarkeit in
der Früchte Fruchtbarkeit, wenn Pflanzen
Fruchtbarkeit Abstammung von der
Reifegrad und Abstammung Fruchtbarkeit
zugleich Früchte und Blumen
die ich, wie wenn in obiger Weise
schwarzen Pflanzen und Abstammung
Pflanzen. Ich habe zwei Früchte
stammen, die ich auf Wunsch Ihnen
C. Nuttallii (C. Engelmannii) Früchte
über Fruchtbarkeit in Früchten
gepflanzt in Moor gestreut mit
Pflanzen Abstammung Früchte
Fruchtbarkeit in Früchten Pflanzen
und die Früchte verschieden?
Früchte Früchte Früchte die
Abstammung C. Torreyana Früchte
Früchte Früchte Früchte auf
in verschiedenen Farbtönen abgepflanzt
Verschiedenheit dyr- oder Abstammung
und ich Früchte mit
dem Namen C. Torreyana Früchte
getragen.

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Der typische Formenkreis der C. Acaulis Koch und
C. heterophylla Koch beginnt mit
Juss. Sehr häufig auf Kalk; allein der
Koch'sche Typus auf schwierigen
Kalk, Sandstein, Gneiss übergeht.
Man vergleiche die Beschreibungen gegebener Arten?
Der Kreis umschreibt also die C. bis
ein begrenztes Gemenge, denn ich
bin der Ansicht dass C. heterophylla
ebenso gut C. Acaulis genannt
werden könnte.

Der C. Acaulis schließt sich zunächst
ziemlich gestreckte Formen an, welche
denen der C. Gaudini ähneln. Die
Formen der Calabrina und Sicilien sind
einander ähnlich. Sie gedrungener als die
C. acaulis; die westlichsten sehen
den Typus der Alpen Formen. Meine
Ansicht ist es gewesen und noch
heute, diese Formen nicht gesondert
abzugrenzen, als die
Grundgestalten bis zu Kalk gehend
sind die der C. acaulis; in dieser
Beziehung stimme ich mit niemand überein
und unterscheide sie an allen
mir bekannten Formen als Abart
von ungekerbten Zellen als die ein
zu Grunde liegende Form. Die allen
Figuren von der T. 4, fig. 21 und
T. IV, 2, 8 abgebildete und im Text
beschriebene Abart, ist scharf sich
eingekerbten Blatt Formen gegenüber
steht. — Die Artenreihe der mir

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Rec'd Jan 3d 1865

von Herrn Norton aus St. Louis in Nordamerika über England und in Holland wird C. subumbellis augegeben allein ich vermisse sie glücklich absolut aus der Gegend seit der Zeit auf der C. ovata beschrieben, ist in Nilling wiederum die Holländische Form und C. strigosa gefunden worden. Ich habe sie auch hier gesammelt und abgebildet Sitzung oder zu übersenden. Die vollständige Beschreibung ist unmöglich in diesen Blättern vollständig von allen Standortsverhältnissen begleitet. Ich habe sie an Herrn Engelmann in St. Louis und Herrn Torr. Herrn Gray in Cambridge gesandt in Californien für

Als C. Durfortea Berlero sehr ähnlich, ohne Notizen über gegenwärtige Pflanzen finden, als sie in Berlin sind, Bitte diese Pflanzen, welche ich gesammelt habe, in Californien und Texas und Mexiko vergleichen zu lassen? Ich bitte Sie, mir Ihre Ansicht darüber mitzutheilen, ob Sie es für nöthig halten, dass ich Ihnen Exemplare schicke, und wenn ja, wie viele

[illegible]

[illegible]

[illegible]

Hegelmaier
Rec. Jan. 3 1865
Ans. Jan. 31

Tübingen, Württemberg
Nov. 18, 1864

Most Honored Sir Doctor !

Professor Alex. Braun was kind enough, to present to me two of your letters, addressed to him as well as enclosed samples of american Callitriche for viewing; the most interesting notations, which I found therein, make me wish eagerly, to turn to you directly.. Primarly I would like to get your permission, to let me use those notations, specially the nomenclature for a small journal essay, which I would like to publish as additions and corrections to the monograph of the Callitrichae, published about 9 months ago.. I do not want to permit their use until having asked you, and, needless to say, with specific references, that I owe them to your communication..

In preparation of the publication I used the literature conscienciously as far as it was available to me.. The circumstance, that, despite this, older existing names for several species described, did escape me - I also looked up the repertorium of Welpers - may serve you primarly as proof, that with us the important and valuable american literature is too little known nor used, which may have as main reason the extent of what has been produced in this area already in Europe..

I cannot take the slightest objection, that your samples of C. Nutt. from Texas peploides, probably determined from original samples, are identical to my C. Drummondi.. Further, that your american C. autumnalis from the St. Lawrence River stream is identical with our europaean..

As A. Braun told me, you will have received in the meantime his C. deflexa from Brazil, and, though you may have formed already an opinion about the particular forms, I nevertheless take the liberty, to present my view in this matter.. Your small sample of C. Nuttallii Torr. from Louisiana ~~incorrect~~, except the stems of the fruit, which were not quite as long as the longest of the brasilian

corresponds with this,specially in the stigmata reflexa per - sistentia,which I do not know from any other form. Further, I can not accept until now the one communicated to Braun from Arkansas with short stems,which you call now C. Engelhardiana Aust. as a species of Nuttallii ([illegible]); I carefully softened fruits of all forms,, let them then somewhat harden in alcohol,and then sketched them,finally sectioned them in as thin slices as possible between hollumtrank (I do not know this word,E.D.),and sketched them too..According to this procedure and the sketches,which I still keep,I can not find any difference in form in the fruits; some differences in form are due to degrees of maturity,and uneven spreading associated with it, and resolve themselves, if one brings the sections obtained above under the microscope. I have seen very short stemmed forms,which I can not at all separate from C. Nuttallii(C. deflexa)from Pennsylvania in the Viennese herbarium; one collected by Moser with specific location data. May these specimens not come from there, and the labels have been mixed up ?? In part these forms carry the designatiom C. terrestris Rafin.; Under this designation I found types in various herbaria as verna verlandformey , and, thus, could not make use of the name C. terrestris Raf. .

I also noticed there, that certain forms of C. Asa Grayi, depending on the leaves, are designated C. linearis Proh. and C. heterophylla; however, Pursch specifically differentiated these forms by their most important point, the fruits. And which of the names by Pursch was to be given to the entire species ? I also found north-americans specimens designated as C linearis, though I could not see if they belonged to C. Asa Greyi as they were sterile..

Of O. truncata.... rather many specimens came before my eyes.

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The forms from Calabria and Sicily were mostly as large fruited as C. autumnalis; the northern ones have in part somewhat smaller fruit. With good and correctly treated material, one can easily convince oneself, that the halves of the fruit are separated to the middle just as with C. autumnalis; in this respect they correspond with each other, and are differentiated from all other forms known to me. The network of dried cells, which is found on the flesh of the fruit, is that illustrated by me beyond any doubt on table T II, fig. 27 and T. IV, 2, ? and described in the text; it glistens through the dried, outer parenchyma cells.

Very interesting to me was, what you say about the occurence of C. ovata (I assume Callitriche ? E.D.) in the Northwest of Germany. Here and in Holland C. autumnalis is mentioned, though I did not have the luck to see something there and also noticed this for C. aut. 5x ..... I thought in Rilley, that at least the dutch form could belong to C. truncata ..... as this one has travelled to Belgium. Now I will try to get material from this region..

Would you not be able to find out, if the the fruit of C. Torr. marginata /, mentioned by you,, fits into the central structure, as I explained and illustrated for C. macropterix or into the common one ? The New-holland species differs in this point most strikingly from all eu- and pseudo-Callistrichae of America, which in general agree in the important point of discentric fruit structure. It would be most interesting, if this one would have a relative in California..

As. C. turfosa Bertero you have, according to your notes, an entirely different plant in hand than the one in the Berlin herbarium. Which one will now be the true one ? In Chile and Peru may be still

something; certain chilenean forms,which I received for examination,can hardly be separated fromm C.verna. That I received of C. stagnalis a form with - though short - stemmed fruits, I remarked there; long-stemmed ones I have so far not seen..

Finally still a word about the classification. I had in time passed a 3 part division, as the one mentioned by you. It did not evade me, that of several species no aquatic form exists. However, I refused it, as I missed the characteristics for defining 1 and 2 - the absence of bracts with No. 1 is not constant - whereas the differences of organization of my two sections are striking and many. The only disturbing factor in my division is the mentioned circumstance of the New-Holland species.. as this differs in a striking point from all others,otherwise in the fruit (position ? E.D.), the stomata, etc lineup with my section 1..

May I ask you for a reply to my request made at the beginning of this letter. You would oblige me much.

Your most devoted Dr. Hegelmaier
Docent of Botany

Tübingen (Württemberg)
Nov. 18, 1864

(translated from German script by E. Denison, March 1989)

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Acer Jun X^m

Hepaticae Africae

Potsmuk 15 May 1865

Geehrtester Freund!

Ich erhielt vor einiger Zeit von Ihnen einen Brief mit einer Sendung Lebermoose, welche Sie mir zur Bestimmung übersandten. Ich habe mich dieser Arbeit mit Vergnügen unterzogen, und theile Ihnen hiermit das Resultat derselben mit. Ich habe mich dabei der Synopsis Hepaticarum von Gottsche, Lindenberg und Nees ab Esenbeck bedient, welche ich Ihnen bestens empfehle, da sie das Beste ist, was wir über diese Familie besitzen. Ich habe mich bemüht, die Arten möglichst genau zu bestimmen, und hoffe, dass mir dies auch in den meisten Fällen gelungen ist. Einige Arten sind mir jedoch zweifelhaft geblieben, und ich habe dieselben mit einem Fragezeichen versehen. Auch habe ich einige Arten, welche mir neu zu sein scheinen, mit Diagnosen versehen, um Ihnen die Bestimmung derselben zu erleichtern. Ich bitte Sie, mir gelegentlich mitzutheilen, ob meine Bestimmungen richtig sind, damit ich dieselben in meinem Herbarium berichtigen kann. Ich habe mich bemüht, die Arten möglichst genau zu bestimmen, und hoffe, dass mir dies auch in den meisten Fällen gelungen ist. Einige Arten sind mir jedoch zweifelhaft geblieben, und ich habe dieselben mit einem Fragezeichen versehen. Auch habe ich einige Arten, welche mir neu zu sein scheinen, mit Diagnosen versehen, um Ihnen die Bestimmung derselben zu erleichtern. Ich bitte Sie, mir gelegentlich mitzutheilen, ob meine Bestimmungen richtig sind, damit ich dieselben in meinem Herbarium berichtigen kann.

Als neu für Afrika habe ich folgende Arten gefunden:

Lejeunea Mariei Steph. = Cheilolejeunea Mariei (Steph.) Jack & Steph.

Lejeunea Wilmsii Steph. = Cheilolejeunea Wilmsii (Steph.) Jack & Steph.

Lejeunea Wrightii Steph. = Cheilolejeunea Wrightii (Steph.) Jack & Steph.

Lejeunea Bescherelleana Steph. = Cheilolejeunea Bescherelleana (Steph.) Jack & Steph.

Lejeunea Pappeana Steph. = Cheilolejeunea Pappeana (Steph.) Jack & Steph.

Lejeunea Schimperi Steph. = Cheilolejeunea Schimperi (Steph.) Jack & Steph.

Lejeunea Hochstetteri Steph. = Cheilolejeunea Hochstetteri (Steph.) Jack & Steph.

Lejeunea Preussiana Steph. = Cheilolejeunea Preussiana (Steph.) Jack & Steph.

Lejeunea Rehmannii Steph. = Cheilolejeunea Rehmannii (Steph.) Jack & Steph.

Lejeunea Rogersii Steph. = Cheilolejeunea Rogersii (Steph.) Jack & Steph.

Lejeunea Wilmsii Steph. = Cheilolejeunea Wilmsii (Steph.) Jack & Steph.

Lejeunea Wrightii Steph. = Cheilolejeunea Wrightii (Steph.) Jack & Steph.

Lejeunea Bescherelleana Steph. = Cheilolejeunea Bescherelleana (Steph.) Jack & Steph.

Lejeunea Pappeana Steph. = Cheilolejeunea Pappeana (Steph.) Jack & Steph.

Lejeunea Schimperi Steph. = Cheilolejeunea Schimperi (Steph.) Jack & Steph.

Lejeunea Hochstetteri Steph. = Cheilolejeunea Hochstetteri (Steph.) Jack & Steph.

Lejeunea Preussiana Steph. = Cheilolejeunea Preussiana (Steph.) Jack & Steph.

Lejeunea Rehmannii Steph. = Cheilolejeunea Rehmannii (Steph.) Jack & Steph.

Lejeunea Rogersii Steph. = Cheilolejeunea Rogersii (Steph.) Jack & Steph.

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Ver. June 8. 1865

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Rec. June 8, 1865

Postmark May 15, 1865
date at end of letter:
May 1, 1865

Most honored Sir !

Your letter, rich in interesting notes, of January 31 of this year with its valuable enclosures, I left long without reply, which I ask ask you kindly to excuse on account of all kinds of circum - stances: Various jobs, several kinds of sickness, and a very deman - ding teaching activity, which did not permit me to get to physiolo- gical studies. Now, that I have examined again some, I am better pre- pared to give a satisfactory reply to some of your presented ques - tions, than it would have been possible earlier. Also, I am now able, to present to you an equally rich assortment of samples, at least enclose something to present to you, which should not be without in- terest to you. Of the exotic Callitriche I have as good as nothing except yours, though I have seen much in collections. Should you be able to improve this condition in the future, I may be able to as - sist you with details.

But, now, to the specific items.! That my C. Drummondi. = C. peploides Nute I convinced myself already earlier from a sample sent by Prof. Braun. I thank you for the specimen of this rare spe- cies. It will interest you, that I got aquainted this spring with 2 more oustanding species with strumose fruits, from New Hol- land (the name given at that time to the South-eastern part of Au- stralia, E.D.), C. ~~pranifera~~ stramifera and C. ~~umbracta~~ umbonata var. C. peploides, very well differentiated from each other; I may describe them in due time and, if possible, illustrate them. May-be there exist also in Ame- rica species with these peculiarities ? If the species, which seems characteristic with round fruits for North America, will get the name C. Asae Greyi Asagraei or one of the three names of Pursch, which seems the first-named one, is of course of no consequence to me. After all, our nomenclature is, so to say, only a necessary evil!

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and I am the very last one, who would insist on a self-created name, if the other botanists can unite on another one. Should it gene - rally become justified, to use an old name for the entire species, then C. heterophylla would however to be most recommended. I would, if nothing had been printed already, what has been printed, name the complete species C. Purshiana, whereby all would have been best considered ~~xxxxxxxx~~. However, for this it is too late. It seems more important to me, that the plants are recognized as truly independent species, and not being thown together for instance with the west-europaean C. obtusangula Legell, which has after all smaller and very elongated fruits. I have recently seen also specimens of it from southern France, years back some from Sardinia and Belgium; earlier, the plants were known with certainty only from several localities in western France. It is mentioned with its traits by the Frenchman Legell, not known more closely to me, and that in a Flora inedita of northern French departments, as can be read on the labels of Billow's Flora gallica et germanica explicata. Centurien (sic, but do not understand meaning, E.D.) are perhaps today the main source for knowledge of C. obtusangula. Against their separation of the antarctic form, I have nothing specific to contradict, the fruits are rather unripe, and that corresponds to all numbers, coming from the antarctic archipelago, which posess also a highly uniform habitat.

C. ~~travolta~~ truncata Guss you seem not to have seen as yet. The two colors, which you may send, are C. hamulata, also the var. Pulai; C. hamulata is also found in South-Europe. The plant obviously immigrated, and the pointed fruited form differs little from the latter; generally more strong (verbatim: "harder" E.D.), and is not frequent in collections, mostly only in small rosettes or fragments. I myself, have only a small sample from Gussone himself.

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Quite commonly one finds her incorrectly labeled, the striped form as O. ~~pedrerolata~~ pedunculata 3α (..... ~~ital.~~ Müller), the more pointed as ~~Opuntia~~ C. brutia Petagna, whereas the latter, according to a sample communicated by Gussone is a small-leaved O. hamulata. By the way, I almost suspect Gussone, that he confused in his Flora .....3β..... as ~~O.~~ C. Brutia the C. truncata ..... sessilis and hamulata in relying too much on fruit-stems and other habitual characteristics, as did also so many other authors. Unfortunately I can only enclose a small sample of C. tr.; should I succeed to obtain in the future real specimens, you will also get some. I saw them recently also from Algiers. C. hamulata and pedunculata are closely related: though I find for the latter a real, though short but suddenly uprising stem, with hamulata really only corners. I have so far seen very little of C. pedunculata sessilis, but never-the less was able to distinguish it. If it ~~xxxxxxx~~ blends into O. hamulata I cannot decide from what I have seen, as that is not enough.

Your C. Nuttallii Torr. permits, as I believe, to be a proper species, because the keel is thrown up in such a strnage manner toward the outside somewhat inside-out, like with no other species. To consider C. Aussini and C. deflexa A.Br. as specific species, is perhaps somewhat audacious, though at first sight a small difference is apparent; the keel with the latter is somewhat broader and its forming cells possess a rich net of reinforcement lasts (which perhaps is connected to the first point). As you possess richer material than I, you may decide, how the species question shall be handled the most expediciously. Does the C. Aussini exist with as long a stem as the Brasilian C. deflexa ABr.? She seems to have some stem at alltimes. At any case, C. Aus~~sini~~ tini and C. deflexa possess crystals in 4α layer, and with it reinforcement lasts. The bases of the latter are very thick and strongly woody, conditions, which seem to go hand in hand; C. peploides and the New Holland C. Mülleri Sond. (~~C.~~ C. variopterix show these pro-

pg 5 top

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perties. With C.Ausselliii and marginata those lasts above are of normal thickness and crystals are absent, the same for C. surfosa Bers. & Berteroiana ..Steud.., about which some remarks are to follow right away..If you want to get aquainted nicely with the forms of the keel cells and the arrangement of the reinforcement lasts, better, than you succeeded through your sections, (because fruits, which have been dried commonly do not permit distinct recognition of the cell boundaries)) then bbl an entire fruit or a partial fruit for a moment in a strong etching-potassium solution, then you can see with ease under the magnifying glass with a needle the keel-cells and likewise the inside of the fruit, and generally dissect the pericarp even on fruits, which had been dried. The lack of crystals and the weak reinforcement lasts seems to be a further proof of the difference of C. Nuttallii. But, could the two named conditions be only based on vegetative differences ? That question I cannot decide at present..

C. surfosa Berz. and indeed the tender, small-fruited form described by him, I sae recently from Peru, and now again in original specimens of Berton from Chile, of which a small sample is enclosed. But Berton has, as the original specimens prove, mixed up this, his good and excellent species with exotic ones, specially a small C. Callitriche, which I consider only a broad-fruited form of C. verna, which seems to be very common in Chile, and such specimens Berton designated as C. turfosa; but one may be able to retain his name for her.

C. Berteroniana Steud I know since a short time from an original specimen, of which here a little sample, the fruits have long stems and in view of their structure have nothing to do with C. stagnalis, which you have.. Keel cells with inclined, net-like reinforcement lasts as C. surfosa, deflexa, Nuttallii, peploides, marginata.. In fact, I do not know how to distinguish this C. Berterdiana from C. marginata; The fruits of C. Berterdiana are a little larger, however the form and the structure

agree remarkably.. (Keel-cells,lack of crystals,moderately thickend lasts, the base of the cells in question,etc) What may you say to this combining ? I do not know, if and how far the flora of California and of Chile show analogies, equally, if forms ,which belong here, exist in the countries lying between them on the West - coast of the Americas.

As I see from your letter, you consider certain forms as belonging to stagnalis, which we in Europe consider as broader fruited forms of verna (on account of the 7α wing). Some such forms do indeed form a considerable connecting link in the swedish monograph,, Sonnroth considered them proper species and named C. polymorpha.. However, if one considers the presence of the wing-like keel of C. stagnalis as the main criterion, one can, as I find, resolve the separation of C. verna and stagnalis anyhow, as this seems practically desirable by the wide distancebetween the specially wide-winged east indian C. stagnalis(s.Wightiana Wall) and our C. minima Hoppe ! According to the named method,, which is my basis,the forms in question can still belong to C. verna, if there exists a wing, its length varies extraordinarily,depending on the more or minor stretching of the related cells. A recently examined very curious autumnalis form from the island Anglesea showed this to me most distinctly; the wings of it have a quite enormous width,and yet, nobody will get the idea, to differntiate it from C. May-be with the above method the contradiction between ~~xxxxxxx~~ xxxxxxxbetween your and mine results will be explained considering 7β . I find this globular or subglobose with C.stagnalis,elliptic for C.verna.May-be you used for this examination as C. stagnalis the broad-fruited verna form ?

Finally still a main point in the grouping. The lack of bracteolae for the terrestrial Callitriche, which you specifically have often

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mentioned,made me doubt the natural certitude of the two part grouping in favor of your 3 part. I thought to have seen earlier bracteoles on the brasilian C.deflexa;With renewed examinations,specifically for this point,I found none, und would rather think,that my memory fooled me. I do not put much weight on this point,and I am used to miss the bracteoles for pedunculata and hamulata,and that with one specimen completely and with the other in part.. If,however,, there would be never bracteoles on terrestrial forms,then this would have to be treated seriously.. Now, the New Holland Callitriche are interesting in a strange way. C.Müller*i* (macropterix) has crystals.. net-like thickening (the most beautiful of all Callitriche),is generally an exquisie terrestrial species,and does not have bracteoles.. The 2 strumose species have also nice net-form thickenings, the one on top of it has crystals, they appear already through the fruit as next relatives of C.peploides,and, quite generally, they appear through the most important characteristics as exquisite species of terrestrial species. But the one C. umbonata is not only found in a terrestrial but also in an easily recognizable swimming form in water (rosettes etc),and further,both land and water forms have bracteoles !I hope to get in the future possession of audtralian Callitriche and would share some with you;up to now, I know such items only from foreign herbaria. How can one under these circumstances become aquainted with the correct species of the Araphibiae ?? Calcite crystals occur,as far as I know,. only by some of the first,but not with all,as I mentioned already.. The reinforcement lasts (verbatim: the thickening lasts, E.D.) form the inner parenchyma layer,which become net-like for the terrestrial forms, however there is an entire transitional series from the tender,ray-like lasts of our europaean species ,which accomplish more tender and stronger,slanting appearing nets by slanting construction (free and possibly faulty translation by E.D.) C. marginalis, Berserriena,deflexa,etc..

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all the way to the beautiful, right-angled latticework of the C. Mülleri. The latter is the most exquisite Callitriche known to me. - What concerns the star-hairs, I have examined that point anew, made aware of it by your note; Star-hairs are found on C. marginata, deflexa, peploides (now Cuba); the other species I have not yet examined for this point. Transitions between my 2 motives I do not know. I remember, having heard A. Braun make the statement, that perhaps of his 3 groups of Isoetes, more correctly, 2 could come closer together. As he thinks now about this point, I do not know.

All in all one may say, that species differentiation in Callitriche is in part difficult; but that is no reason, to not fix the the striking types as species. Because even good species could (and should) pass into others, not stand next to each other without connection. For that reason, he who separated and he who connects, may in certain cases in reality both be right.

My real study for now and the near time are the Lemnaceae. Here the species difference is simple and easy. The difficulties lie on other problems, which are not minor. I know from Northamerica L. minor, trisulca, polyrhiza (no space). L. gibba seems to be missing there. Equally I do not know of any Wolffia there. L. umbracta A.Br. is L. polyrrhiza. I have already looked at much and valuable material, and, in part, own it. But the study of the history of development, will probably take much time.

I have not yet published anything about Callitriche, and I also did not receive the dissertation about american species, kindly promised by you, nor seen. When I will be able to to assemble my collected material, I do not know at this moment. Though I repeat the above promises concerning callitrichological aquisitions, I commend myself to you for any possible futureoccasions for shipments to Europe of american Callitriche, of which I possess nothing except what came to

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me through your kindness.. The many beautiful specimens of C. Asae Greyi heterophylla, which are in the collections, are almost all from St. Louis, in part collected by Geyer, in part by Hiehl..

Still another point comes to mind.. The existence of C. verna in the southern band of Northamerica to New Orleans, I formulated,, based on notes made in perusing various herbaria; a believe, to remember having seen it with the locality designation Charleston. However, the related specimens are not availble to me any more. I was in the beginning not aware enough of the various forms of C.. Asagraei which I would have believed to be brevifolia, and the latter for C. verna terrestris, because outer similarity exists.. But, I cannot say anything for certain. Often the fault with wrong labelling are such procedures.. I will send you in winter a fragment of C.. truncata Guss with a locality designation Pennsylvania !!

With complete esteem, your most devoted

Dr. Hegelmaier

Tubingen May 1, 1865

(translated from German script by E. Denison, April 1989)

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Rec'd Jan 26th 1867
Ans Jan 27th

Acknowledges Doctor's

Memorandum in relation to the
Herbarium & Library of the late Prof. Torrey
in case the latter should
[illegible] the Botanical Museum
[illegible] Botanical Gardens
[illegible] Trustees
of the Gardens [illegible] the Museum
[illegible] Library
[illegible] Herbarium
[illegible] Prof. Torrey
[illegible] a Note in the [illegible]
[illegible] Herbarium [illegible] a Catalogue
[illegible] Collections
[illegible] and [illegible]
[illegible] Gardens) [illegible]. I [illegible]
[illegible] Time [illegible]
[illegible] Gentlemen [illegible]
[illegible] Gray [illegible]
[illegible] Letter [illegible]
[illegible] Duplicates [illegible]
[illegible] Exchange
[illegible] Plants [illegible]
[illegible] Letters [illegible]
[illegible] Specimens

1

Stammgattungen entspricht. Alle
meine Gegenstände sind hier mit
Ausnahme der Gattung Cyperus, welche
mir zweifelhaft ist, in der Gruppirung in
der Reihenfolge beizubehalten und
vorläufig die Gruppirung in Verbindung mit
der folgenden Illustration Ihnen hier-
selbst vorlegen darf. Ich bin
bis jetzt noch gesonnen, die in Kew
befindlichen Arten einer genauen Prüfung
zu unterwerfen, gegenwärtig aber durch
Krankheit verhindert, diese Arbeit
selbst vorzunehmen, bitte ich Sie
mir gefälligst Ihre Ansicht darüber
mitzutheilen.

Hochachtungsvoll

Ihr ergebener

Boeckeler

Die Abtheilungen der Cyperaceen sind
wie folgt angeordnet: I. Abtheilung polystachyae
Lemonatae Nees. ein Ährchen viel
Spirl reich) und seine Gattungen

Mariscus

Herr und Bruder Abraham Steffler
sel. Ehe Weibs Anna Maria geb. Zeller
auf Briarbay (Carol. N. Carb.) wohnh.
hat abwesend die Ehre Ihnen die traurige
Nachricht zu geben, welche ihr abscheidlichen
Hinterlassenschaft diese und jenen der 3 grauen
Ihren Anverwandten, Freunden & Bekannten
als kaum erhalten, schmerzt Sie selbig
L. perpusilla Torr. ist auf den Gipfeln
Mitchell Berg einer der höchsten
Berge, Appalachian und wahrscheinlich
die höchste Berg Berg Carolinas
mit ziemlich Augen beschäftigt sind
noch beschäftigt und Ihren Namen
wie erst bey Ihr Rückkehr bekannt
gemacht ist glaubte die Commodore
Lieferant Freundlich gesinnt zu sein
Ihnen diese Gelegenheit zu
Ihnen nicht zu Ehr. Ich wünsche
Ihnen ob und wo diese Pflanze
von Torrey beschrieben worden und
Ihnen Ihre Antwort mit Ihr
vergnügt, vielleicht über berühmt
die Gefälligkeit Ihnen wenden wie die
Ihnen mit einem neuen Mord zu
geben. Ihnen sehr ergeben
Ihr Ihr Ihr
Jersey Pennsylvania Carolina Georgia
und Ihr Illinois, Michigan

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GEORGE ENGELMANN PAPERS

Hegelmaier
Rec. Jan. 26,1867
Ans. Jan. 27

Tübingen Dec. 18, 1866

Most Honored Sir Doctor !

I can impossibly avoid to thank you for two letters, which came during the last months, before the year comes to an end: for the transactions of the Academy of Science, which came to me by way of the local university library, and ,then, for the american water-lenses (this is ~~possibly~~ the German for "Lemna", E.D.), which came to me through Prof. Braun..

From a notation in the first I learned under announcements,, that a dissertation by you about Callitriche has been advanced for printing (and, most likely, has been printed in the meantime). I hope,, to be able, to send to you in the not too distant future a small theme of the same subject, which has been sent for some time to be printed, and, in which I have tried to combine the results of a gradual cross-section of a number of collections and supports from you and other sources about questionable problems. General questions are little touched here, but the reasons, which forced me to retain the grouping into two sections, and, which I hope will obtain your approval in connection with the related illustrations. Unfortunately, I have up to now not succeeded, to achieve for the New-Holland species, which are especially important in this relation, a distribution, not only for my collection, much less so for publication (verbatim: "distribution" E.D.). Should this come to pass in the future, I shall not fail, to get samples to you. As to the number of accepted species, I will probably be not in harmony with you, as I strived for a maximal contraction, however, I am convinced, that arbitrariness has much leeway in this point, and differences are thus of little consequence..

The examination of the Lemnaceae gave me much pleasure; represented are L. trisulca polyrrhiza (s. umbonata A.Brn. a difference does

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not exist) and minor, to the latter belong besides others also the plants from Cuba (Wright No. 3215) as also Grisebach (Catal. pl. Cub.) determined them; anyhow, the very first view will tell you, which belong to this or that of the 3 named species, as long as you know, that no others are with them. Finally, L. perpusilla Torr. is after all that beautiful material, a most outstanding, systematically and morphologically interesting species, the study of which occupied me rather long and still occupies me, and the name of which became known to me only through your communication; I believe to have gathered the lemnological literature pretty completely, but I see at this occasion, that this was not the case. I actually do not know, where and if this plant of Torrey has been described, and would be very much obliged to you, if on occasion, perhaps by way of Berlin,, you would give me this notation with a single word.. I have seen this little plant besides your flowering specimen from New Jersey, only from Illinois as a new species from Hon. v.Leonhardt, who had found it besides trisulca and polyrrhiza and an Utricularia sent by you. The name was - as mentioned - unknown to me (and him), and further I have no idea, how far the plant may be distributed in America..

The family of water-lenses (the German word for Lemnae, E.D.) is, as appears by and by,, not that small, and tropical America has several strange species. As few difficulties make the differences of the latter and as plain develop thus the systematic conditions,. as difficult - at least in part - is the morphology, and for that reason the work cannot be launched right away; but, I believe, the major part of the examinations has been completed.. Dilletantism has recently in England thrown itself with preference on these plants,. without even touching on the difficult questions. The american literature is to us in Germany much too little known and available, as

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you see from the above. With recommendation of the highest esteem Your most devoted

Dr. Hegelmaier

Tübingen Dec. 28, 1866

(translated from German script by E. Denison, March 1989)

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Acc: May 1st
Aug July 1st

Tübingen d. 7. April 1887.

Hochgeehrter Herr Doctor!

Ihren freundlichen Brief mit Ihrer werthvollen Zusendung, welche am 27. Jan. [illegible] hier eintraf, habe ich, wie Sie wohl denken werden, sofort beantwortet. Allein ich habe nicht ausdrücklich Ihre Adresse in diesem Briefe angegeben, weil ich damals noch nicht wußte, wo ich mich in Paris niederlassen würde. Ich hatte damals die Absicht, mich in der Nähe des Jardin des Plantes zu halten, weil ich dort meine Collegien zu hören gedachte. Da ich aber bis jetzt noch keine Wohnung gefunden habe, so bitte ich Sie, mir Ihre Adresse gefälligst mitzutheilen, damit ich Ihnen meine Ankunft in Paris anzeigen kann.

Vor Allem meinen besten Dank für Ihre freundliche Zusendung. Ich habe mich sehr gefreut, wieder einmal ein Lebenszeichen von Ihnen zu erhalten, und ich bedauere nur, daß ich Ihnen nicht früher geantwortet habe. Allein ich habe mich augenblicklich sehr mit Arbeiten überhäuft, und ich wollte Ihnen nicht eher schreiben, als bis ich Ihnen etwas Bestimmtes über meine Reise mittheilen könnte. Ich hoffe Ihnen binnen wenigen Tagen definitiv mittheilen zu können, wann ich nach Paris zu kommen gedenke.

Ich habe jetzt die hiesigen chemischen Anstalten und Institute besucht und mich mit Herrn Prof. Wendel — Universitäts-Docent — und Herrn Dr. Wislicenus — Assistent — angefreundet. Ich habe mich auch bei Herrn Prof. Wendel für Herbstsemester als Praktikant gemeldet, und ich werde jetzt wie ein Glied des Laboratoriums behandelt. Ich habe mir auch bereits einen Schlüssel zu meinem Arbeitstisch ausgebeten, und ich habe mich auch bereits in die Geheimnisse der Schlüssel eingeweiht. Ich habe mich auch bereits in die Geheimnisse der Schlüssel eingeweiht. Ich habe mich auch bereits in die Geheimnisse der Schlüssel eingeweiht.

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(Austin) dagegen möchte ich eine Varietät sehen, die sich durch die Form der Blätter, durch die zurückgebogenen Ränder, durch die Behaarung der Unterseite, durch die Form der Früchte und durch die Größe der Samen (40–50 : 14–16 riefig) von mollis unterscheidet. Ich habe diese Unterschiede nicht gefunden, vielmehr sind die Formen der Blätter sehr variabel, ebenso die Behaarung der Unterseite, die Früchte sind gleich klein und die Samen gleich groß. Ich habe auch keine Früchte von Austin gesehen, die vollständig ausgebildet waren. Die Früchte sind meist verkümmert. Ich habe die Pflanze in Texas und Florida gesammelt.

Nun zu der L. pergamilla ambrosiaca Aut. und gibbosa americana Willd. Ich bin, wie ich bis jetzt sehen konnte, der Ansicht, daß diese Pflanzen nicht verschieden sind. Die Form der Blätter ist sehr variabel, ebenso die Behaarung. Die Früchte sind meist verkümmert. Ich habe die Pflanze in Texas und Florida gesammelt.

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+ ebenso

Ausschließlich

L. Vogelmeieri ist meines Erachtens nahe verwandt mit L. pergamilla gibbosa Willd. Ich habe sie in Texas gefunden und — sie von St. Louis (Engelm.). Ich habe auch Exemplare gesehen, die unter Boden und Früchten mit L. pergamilla übereinstimmen, jedoch durch die Behaarung der Unterseite der Blätter sich unterscheiden. Ich habe sie in Texas und Florida gesammelt.

Unter der L. pergamilla ambrosiaca Aut. und gibbosa americana Willd. sind meines Erachtens zwei Arten zu verstehen: Exemplare der Willd. gibbosa Herbarium unterscheiden sich von solchen der L. pergamilla ambrosiaca Aut. durch die Behaarung der Unterseite der Blätter, durch die Form der Früchte und durch die Größe der Samen. Ich habe die Pflanze in Texas und Florida gesammelt.

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Unter der L. pergamilla ambrosiaca Aut. und gibbosa americana Willd. sind meines Erachtens zwei Arten zu verstehen: Exemplare der Willd. gibbosa Herbarium unterscheiden sich von solchen der L. pergamilla ambrosiaca Aut. durch die Behaarung der Unterseite der Blätter, durch die Form der Früchte und durch die Größe der Samen (Austin; Elsten Austin; Old Quarries, St. Louis, Engelm.; Newberry Austin; Newberry Austin) in einer Weise, daß ich sie nicht für verschiedene Species halten kann.

Acc Mag 1-1867

mit Natrium verschmolzen gibt blaue
giftige Verbindung für Rothmeister. Ich
sah wie er den Stoff untersuchen
seinen geschrieb Zeichnungen und Farbige
Präparate gemacht da wir Jetzt Ostern
kommen werden Mit einer schönen Blumen
Wolke ich noch einmal wiederkommen zu
können ich schreibe viele Briefe morgen
gleichfalls ein da Ich dir herzlich wünsche
Pfingsten Mittag verspreche ich viel
von ausführlich schreiben zu können.
Mit vollkommener Hochachtung

Ihr

ergebenster

Tübingen d. 7 Apr 1868. Hegelmaier

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GEORGE ENGELMANN PAPERS

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Hegelmaier
Rec. May 1
Ans. July 1

(6)

Tübingen, April 7,1867

Most Honored Sir Doctor !

Already in possession of the second of your kind shipments since several weeks,which are dated Jan.27 and Feb. 11,I should, as you may think, have answered you faster. However, I did not have the time at the moment to work through the material with some kind of leisure, because in these first academic years one is tied down in several ways, the more so, if one is saddled with lectures about different special disciplines, and further, this working through the material,as far as I have been able to advance, takes 2 - 3 weeks,so that I came only today to preliminary conclusions and can make statements at least about some, at least.

First of all my best thanks,which I ask you to pass on to Mr. Austin,because I do not write english. What of my notes may have interest for him, please have the kindness to communicate to him. I hope, to be able in the not too distant future,to express my gratitude to both of you further.

I searched in the local academic collection,which contains the herbarium of Stendel and Freund and special compatriote Hochstetter, after a Juncus α ,but in vain. The herbarium of Stendel is supposed, as I leaned by accident recently, to be now in possession of a count Alb.de Franqueville,rue Palatine 5,Paris. One sent to me sometime earlier from the latter's collection the Callitriche,and, there were within them several original labels by Stendel. Ad rerum Callitriche ;Your C.heteropoda is a very strange item: The fruit rounded as with antarctica and such, but a fruit stem present,though I could not find how microcarpa differs substantially from peploides. The fruit distinctly strumose. The vegetative organs however relatively modestly robust,but I have seen peploides also from Louisiana like this (in Karl Burhinger). In the essay,

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which hopefully will soon be in print,and which I will send you immediately, I take the liberty, to direct your attention to a species described and illustrated as C. umbonata. I do not know, where this kind of a form belongs in the classification adopted by you. Unfortunately, I cannot share it with you, as I have only seen it in the herbarium of Sonder; I always hope, to convince Dr.F.Müller to share New Holland items, in which I have not succeeded up to now. If in the future something could be obtained, I would share with you.

But back to the Lemnaceae. What I have myself of the desired items I herewith mentiom. The polyrrhiza, as far as I know her, is always sterile, perhaps she may be sometimes be fertile in the tropics ? In Europe, she is supposed to have been found twice in flower (both times with one flower), once by Schleicher,who'se statement I readily trust, and once by Hans v.Ehenbeck - if it is true -; to him the specimen is supposed to have been"lost" ! I am completely resigned, to be able to examine this one in flower or fruit, and consider myself excused, that I can not deliver her. L. gibba is in Central Europe also almost always sterile, it does not grow in groups, but here and there mixed with other species.. Flowers and fruits I have up to now seen only from Italy and Afrika, but she seems more inclied to come into flower in warmer countries,where she develops also much stronger vegetatively. That,by the way, she has been found in flower in Germany, England,is known from the literature. I myself saw her living only sterile, she is entirely missing in the local area. The little,which you get here, is the one half of a little Portira,which I myself retained - per nefas - from a foreign herbarium,which came through my hands. L. ~~tricolor~~ trinervis I have seen alive 3 times in flower (though this one is considered rare in flower). A few fruits and seeds I was only able to obtain ,by cultivating at home in an aquarium a large number, which

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I had gathered during a several days journey last summer in the Palatinat, of which 6 permitted germination and development of seeds. I have only flowers available..

L. minor I know in fruit only from New Holland specimens, which I received for examination, in flower one finds her very rarely, but single, if one looks carefully through an assortment piece by piece. I do not have her preserved, as up to now I inserted such fruits in alcohol to prepare them for examination.

I shal undertake at whituntide a trip of several days to the Rhein Valley, exclusively to search for seeds, because here, in this hilly and water-poor terrain, it is very poorly represented. If I am lucky, I will get minor and trisulca florens and gibba sterile. I will preserve this time, which I normally have not done, and shall send you, whatever I get myself. I do not dare to hope for flowering gibba.

Concerning the american Lemnae (verbatim German = "water-lenses") I unfortunately made some remarks in my last letter, about who'se wrongness I have convinced myself through present, careful examinations; I had made the earlier examination somewhat hurridly with exception of the striking and interesting L. Torreyi. The result of this was, that I threw together the perpusilla (ocra) with minor, which was the more irresponsible, as she looks rather different, so that I now dare to distinguish her sterile from minor easily, and because I knew her already and had examined her under a name which had come to me in a letter from Karsten - .. Mr. Austin is entirely correct, to describe the one-nerved little plantlet (New Jersey, Arizona, & Missouri etc) as a new species: L. Torreyi - which name must remain - That this plantlet is not L. perpusilla Torr. does not prove the description of Torrey, with which not much can be accomplished, but the origonal specimen of Torrey, of which A. had the kindness to provide me with a proof, and which originated from

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the Corus classicus mentioned in the description (Staten Island). Lemna perpusilla is according to my opinion not only one of these L.Torreyi, but should be specifically separated from L.minor; the 3α and Semen atropurpurea are huge, and, as already mentioned, the appearance of the sprout is somewhat different. To perpusilla belong of the received numbers the following: 1) Staten Island (Torr), 2) Wayne ,Pennsylv.(Austin) 3)Western Missouri (Broadhead)) 4) ponds on the hills about St. Louis (Fendler 5)Pennsylv. near the Leikawaxen (??? E.D.) River (Austin) 6) Cuba (Whright N.3215) .. I do not put much valua on a differentiation of a var. trinervis, one sees the 3 nerves always with proper treatment. Of more impact is an other difference; there are forms with many and forms with few ribbbed seeds (40 - 50; 14 - 16 ribs): var multi - and pauci - costata mihi; I can find this difference only through exacting,

4α dissection, externally the forms are so similar, that despite the striking difference ~~xx~~ certainly no specific distinguishing fact can be based on it. The paucicostata seems to be the more southerly form, and I saw her fist - and that in the herba - rium of Karsten - from Venezuela; and Karsten wanted to name her in a letter L.Hegelmaieri, while I intend to describe them, as said already as L. paucicostata or L.perpusilla. To this belongs also the kind from Cuba and - the one from St.Louis (Fendler). To the L.multicostata belong the other kinds from the Union. Anyhow, this L.perpusilla has the good trait, in contrast to the others, to produce industrially fruits.

4β Now, as to the perpusilla enberlida Aust. and gibba americana, I confess, that despite carefull dissection, I cannot distinguish her from our L. minor. The first is in any case no perpusilla, the latter no gibba. If specific characteristics should not be present, which have escaped me until now, then I must pull the forms belon-

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ging here to minor (New Jersey, Austin; Closter,Austin;Old Quarries, St. Louis,Engelm.; New Durham, Austin) and further also the typel from Orange, New York,mixed up next to polyrrhiza with the small Wolffia, which Austin designates as perpusilla trinervis. From all this there seems to emerge: that, besides the specific american species, which flower more often,our L. Minor is also widely distributed in Northamerica,but, unfortunately,just as with us, is commonly sterile, and only fertile toward the South..

L. gibba from Arizona, Equador and N.Granada are in my opinion gigantic. With us in Germany this plant does not grow as robust as in Italy,Afrika,and, as I see, in the warmer parts of America..

About the 2 dubious "species dubiae" L. 4 8 Austin and undulata Austin I ask for now to excuse me from a pronouncement,I shall in the next months examine carefully the circle of forms belonging to L. trisulca ((which relations seem to belong here)) and taking my time and, after that, I shall also examine the tiny probes.. One knows a Lemna only after weeks and months having examined her in all dimensions, with all possible resources and methodes..

Wolffia maxima Aust. (Wright Cuba N.3215) in my sample of it is nothing to be found of it = W.Welwitschii mihi, Seem Journ. of Botany 1865 p 114; the common appearance in tropical Afrika and America is surprising; I have however seen her also from South American continent,, there can be no doubt about the identity; of the african specimens,, which I was permitted to examine,, some were in flower,and I plan,to publish the related drawings in the determining monograph..

Wolffia Delilii Aust (non Schleide) from Orange, New York. is in my opinion = W. columbiana Karsten (Botan. Untersuchungen I, p.103); I had at the time some several original specimens (sterile) for examination, and according to the made illustrations (with enlargements))

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Rec Nov 1st
Ans Dec 20

Tübingen d 2 Oct. 1852

Verehrter Herr Doctor!

Ich komme in dem Anliegen zu Ihnen
mich folgendes
Ich bin Theologe, habe mich auf
Universität als solcher immatriculiren lassen
habe Collegien gehört, die hierher gehören
gegenwärtig ausgearbeitet, bin
entschlossen und fest entschlossen
meine Studien
Ich habe
nicht Lust
Ich
Ich
Ich

Missouri Botanical Garden
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Rec'd Nov 1st 1867 N.Y.

Mindsfeld Hessen Cass Co
Illinois

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GEORGE ENGELMANN PAPERS

Schedae, die allerdings sehr
selten sind, von Hrn. Pringle in
Orange Co., und somit für
Florida neues ch. H. Allen
hier hat. Wahrscheinlich
werden die beiden in Süd-
amerika sehr häufigen
Arten (vermischt in
den mir vorliegenden Exem-
plaren) auch in Florida gefun-
den werden. H. verbreitet
sich weiter
darüber in der nächsten
Zeit ausführlich.
Freundschaftlichen Gruß

Ihr

ergebener

L. Engelmann.

St. Louis, 6 Aug.

Ich denke, Prof. Gray hat Ihnen von
den Beiträgen zu Amerikas Flora des Hrn.
Baron Friedrichsthal etwas gesagt.

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Rec. Nov. 1
Ans. Dec. 20

Hegelmaier

Tubingen Oct. 3, 1867

Honored Sir Doctor !

You get aqauinted in the original of the enclosed little picture with a very poor letter writer, because I need to answer you for not less than 3 letters, which came to me during the last one half year, the last only very recently, and also for the interesting enclosures. The reason is, that I get to make systematic research only, when some materisl has come together. The others parts of the labour are very time consuming. I would however not write to you, without giving you my opinions based on careful examination, taking several days labor, about the sent items.

The first of your 3 letters (dated March 11 of the current year), which came via Frankfurt, has actually been disposed of by one which crossed it on the way, which you received as I perceive from a later one. It deals with Lemna perpusilla, which Austin as well as you and I distinguish from minor on account of the ovulum atropeum.... , as much as it is also different from L. Torreyi; further of Juncus 2∝ Fleers, which, as I wrote already, I cannot obtain here.

Your 2nd letter is of June 30 and contained a seedling of L. perpusilla 2β from your area beside grown specimens of these. Apparently the seeds ripened in late fall germinate not until the following year. Our native species can also be kept until Spring, and then only be brought to germinate; on the other hand I do know from own observations, that L. trisulca Gibb and minor can germinate in the same summer, in which the seeds ripened, and that is for our most common species the norm. It was of real interest to me, to be able to determine, that, that perpusilla corresponds in certain peculiarities of the germination process with the europaean. The Pedrogonia (?? E.D.) and Spirogyra fruit attach themselves to

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the seedlings and roots, just as this is quite common here, with the seedlings suffering badly under these guests. Further, you sent me then Lemna gibba c. fr. (cum fructo ? E.D) from the Palatinat. I was this year not less than 3 times in the same area only for the sake of the Lemnas, and, as you see, have found all the desired; You will get samples of this.

Finally your last and most important shipment of August 21. What Mr. Hall communicates from Illinois, is, as you probably have found out yourself in the meantime, L. perpusilla multirostrata, not minor. You ask, why I do not know multi - and parvi-rostrata ? The first has seeds (could be another word, E.D.), which have usually 40 - 45 ribs (of which many are wavy or humped); with the above mentioned species I find 60 - 62. The latter has on the specimens from Missouri 12 - 15 ribs, ~~what~~ our the Columbian, Erl Karsten has named L. Hegelmaieri, has ~~is~~ 18 - 20. Should one cover all those variations with specific names ? The essential of the difference can only be determined through a history of development of the septa, about which I do not want to hold a lecture for you now. I am totally convinced, that, if we had a complete assortment of forms, there would probably be one with seeds of 30 ribs between them; until then, there is no real transition at hand. However, though I am not very persuaded by the name given by Karsten, I have retained the method of treatment, adopted by me od the subject, because I would indeed be not capable, to distinguish multi - and parvi-rostrate (or: pauci- E.D.) in the sterile stage. I may eventually venture, to distinguish sterile minor and sterile perpusilla though the first in habitus and the latter also in size show extreme variations.

Further, you send me L. minor from New Mexico (Fendler N 1000). I am until now, despite your remarks, of the opinion, that the

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americans of Dr. Begliser are mostly sterile forms of minor, and believe, I would change my view only then, if such forms, which you consider as different, would be found sometime in fruit, and, then if indeed it was found, that they do not belong here; L. minor exists with us and in other places in most different sizes and most different habitus, the differences being enormous, and yet belongs better together, if one passes through the innumerous forms. I am convinced. L. gibba is found at times with flat frondibus underneath- I send you such a small sample. But, permits to be distinguished easily from L. minor when sterile, once one is aquainted with it. Generally gibba and trisulca do not vary as much habitually as minor. Gibba I have from you from America in 3 specimens, 1) from Arizona (Cones & Palmer N.425) 2) Frundor (..... Herb. A. Gray) and 3) New-Granada
New Granada (the spanish province, now Central America, E.D.) (Holten 714; this is the strongest form I have ever seen).

The most interesting however are the little Wolffias, specially the remark that Wolffia Delilea (which, according to present usus is to be named W. hyalina) something toto orelo different from W. arrhiza, as you will see from the small enclosure; Kurz, as one can see in reading his article, has not even read the, despite all that windiness, exact description of Schleicher or looked at the specimens keeping understandibly quiet. However, one can not spread out (verbatim: beat flat, E.D.) every minute detail nor nonsense in a journal article of one's own, or I would have done so long ago.. -

Our arrhiza is in its care a special form, specially in its size, a quite variable item, even though there can be no doubt about the unity of the species. I have a specimen from the Normandy (and 2 in spirits) , where there cannot be any doubt about the accuracy of measurements with 1.55 mm long (written in former German as 1,5mm)

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.....Sprouts.....(the German word is ~~Spirschen, ?? E.D.~~ Sprossen) In Germany it is smaller, 0.1... mm long and less, in other places it appears even smaller, down to 0.5 and 0.4. What however none of the observers has seen on this so well distributed plant, and, what does not exist, is pigmentation in the epidermis. These are, as far as we know generally until now, just as characteristic for certain species (as W. brasiliensis and Welwitschii) as for certain others (arrhiza, columbiana) as no human being has seen them, and for this reason, as I believe, the presented arrhiza var. serulosa from Detroit does not belong to arrhiza. It will primarly depend, if the specific american form has always the pigmentation. You receive here a small original sample of W. brasiliensis, of which I myself have of course only very little. It will certainly interest you, that the plantlets, which are in part flowering and in fruit, are on average ¼ larger than yours from Detroit, which I received; and the pigment in the pigment cells is larger, and, thus, the points are darker. Both are, according to my experience so far differences of little meaning, and I attribute your plantlets most determintly to W. brasiliensis. Both have a placea (??? E.D.) with numerous split-openings provided air-openings. . The stomata are considerably smaller than with arrhiza. With W. columbiana the upper surface is apparently convex, thus the overall form of the front ellipsoid and what ties in to that, there are only few stomata; with the original plants of Kersten I find normally 2 - 3, the northern ones have some more, and are somewhat more robust than the others, of which I today cannot share any, because at this time I have only my drawings and notes. Kersten's diagnosis is very ..short... and besides incorrect. It is called Botanische Untersuchungen V, p. 106: "W. columbiana bald and without glands and provided with one slit-opening. W. brasiliensis Wedd. bald, with warty glands (!) and as the following with many slit-openings

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" W. arrhiza (Michelu Schleid) somewhat bristly warty (?) "
With it a completely missed analysis of the fruiting bodies with illustrations. Thus, obviously decisive is the examination, which I have made of the Kersten specimens, and the results of which you know..

Concerning Callitrichae , your striking remarks in your last letter are very interesting; I sent already some time back the brochure of the theme about this subject away, and will have to delay the elaboration of your latest contributions for an eventual occasion, for which certainly the opportunity will arise, because sooner or later something will be obtained. I hope, to get the theme finally completed very soon, whereupon the long promised specimens will be sent immediately to you. Writings for Societies are often very slow ones. Very interesting and enjoyable is for me your statement, that C. marginata and Bertero(n)iana are supposed to be very similar. I came independently to the same result, and you will find, that I subordinated the latter as subspecies to the first.. If one does not combine in this way, what can be combined in any way, then one must describe every form and number of Callitriche as a species.. What others consider as species, I do not object, and they have perhaps just as much the right to do so..

I expect to come to an end in the examination of the Lemnaceae during the winter, so that the booklet may be in your hands in a year,, if all goes well. Your contributions are now with those of Mr.. Welwitsch the most valuable , which I obtained, and I must thank you again and again most heartily for your many and large kindnesses. Whatever you may have to contribute until the completion, will be welcome with best thanks.. You announced in your letter some items in spiritus, and thus, I am looking forward with most friendly anticipation . Your most devoted

T. Hegelmaier

(translated from German script by E. Denison, March 1989))

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F. Hegelmaier Tübingen Oct. 4, 1867

This is a postscript to Hegelmaier's letter to Dr, Engelmann of Oct. 3, 1867 E.D..

Repeated examination lets me come to the result, that your Wolffia from Detroit can not be separated from brasiliensis, the differences in dimensions are on average not as great as I thought in the beginning; remains thus only the larger quantity of pigment as with the original plant of Widdell, which I consider very insignificant as a characteristic.

Of the samples from Orange County from Mr. Austin I have searched in vain until now for this type, may-be I will find her still, when I soak the entire supply and make use of it. It seems to be rarer than W. columbianum. What you send me from St. Louis is however identical with the plantlets from Orange CountyThe two Wolffias fruiting in South America, are probably found only sterile with you (at least in the northern states). W. arrhiza behaves in the Old World in a quite analogous way..

Greeting you with highest esteem, Your

F. Hegelmaier

Tübingen,
Oct. 4, 1867

I think, at most one could separate your Wolffia as a variety from the typical brasiliensis

(translated from German script by E.Denison, May 1989)

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GEORGE ENGELMANN HERBARIUM

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HISTORICAL CARDEN
GEORGE ENGELMANN PAPERS

Rec'd Nov 6

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Hegelmaier
Rec. Nov. 6,1867
ans. Dec.20

Tübingen Oct.10,1867

Most honored Sir Doctor !

After having mailed a letter to you today a week ago, I re - ceive today a letter mailing from you with Wolffia from Illinois and W. Wilwitschii from Cuba.

You certainly have the right to be impatient, and I tried to excuse myself in my last letter as well as I could. I am over the summer much overloaded with teaching activities, and, thus, my free time is important to me, to porvide live material, and to study the most important developmental processes in the open through travelling,, so that I could not undertake to make systematic examinations, as these objects by their nature must be undertaken with considerable leisure, if one expects to receive worthwhile results..

W. Welwitschii I received once before from you from Cuba, I believe then, when you sent me the items of the Hon. Austin. The determination came from me, and was based on the specimens sent to me then. As you do not seem to trust the designation fully,I take the liberty to enclose a few fronds of the african original plants,with the wish, that your doubt will thus be eliminated. I remark only (in case the specimens should not appear entirely identical by accident with yours), that I examined, measured and drew a number of fronds of the africans from Banu land of various dimensions; all are remarkably elongated,though in varying dimensions, as you find it for the american plantlets and describe..

Considering Wolffia arrhiza maculosa I have already communicated my view, and rejoyce, that you came to the same opinion in the meantime - that they are brasiliensis,,

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It will be the more interesting for you to see these originals. Only, I do not entirely agree with you, when you write, that ~~the~~ your arrhiza maculosa and the europaean are identical in the size of their cells; and in contrast to brasiliensis smaller celled.I used specimens from Michigan (Bigelow) for examination; in examining dried specimens, it is best to use the epidermis cells (surface with 4 α to compare with lower) and the stomata, and I find,that brasiliensis originalis differ in average dimensions only little: the latter with few large cells,but differs in this point considerably from arrhiza europaea and also arrhiza maculosa and brasiliensis orig. stand much lower than arrhiza europaea. It will form a kind of connecting link between the two latter,. also on account of the lesser pigmentation. Thus, we have the choice between 4 kinds: 1) all 3 forms form one species,against which there is not much to be said,if only for the arrhiza of the old world no pigment cells exist. 2) 3 species, this can hardly be accomplished,. until sometime later material from other parts of America are present.. 3) arrhiza maculosa is joined with arrhiza and is separated from brasiliensis 4) arrhiza maculosa is being combined with brasiliensis and is being separated from arrhiza ,and would be called brasiliensis. This would be the most inoportune, and L. arrhiza maculosa is being united with brasiliensis and separated from arrhiza; this seems to me, from what I have seen so far, the most oportune,though I have often pronounced, that in all such cases,where interim forms exist between true specimens of very different species,according to my conviction the systematic order will limp, and - au font - one can only deal with the volitio..

As I get to such problems, I must examine the presently re - ceived Wolffias from Illinois carefully and compare them with other forms.

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From Karsten's work I have communicated the most necessary. It does not deal at all with the forms but with the growing of the plants,and the W.columbiana is there only illustrated incidentally as a paradigm, and in a note below the margin (i.e. "a footnote" E.D.) (as recently remarked) entirely wrong diagnosed for W.columbiana, arrhiza and brasiliensis.

I forgot recently to enclose a sample of L.Hegelmaieri, which name has been used only in letters. As you will see, it belongs into the form category of the perpusilla Hahn ? ..... emptiori, and that, to use my terminology to ~~parvicostata~~ paucicostata (? E.D.) . The fruit and seeds are somewhat short, but there are also considerably lon - ger ones,and, in this regard, I find also in the north-american forms great differences. You are intirely correct, that the sculpture of the septa is significantly different from the multicostata; yes, I add, that also a dissection of it shows considerable differences,and that also in that regard the ones of Karsten and the north-american paucicostata on the one side and the multicostata stand decidedly opposite each other. Under present day systematic ideas one can in this case, as is done so frequently,accept species almost as well as subspecies. My own experience is, that through examination of multiple forms as a rule the disposition is to combine, and if others come out in reverse,they have in the end subjectis constantis (? E.D.) many parts. Objectively, neither of the two is right, and Nature will not permit to be squeezed into our schemes.

The Lemnae in spirits, of which you write again this time, have not yet arrived, and I look forward to them with immense joy.

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With heartiest greetings, Your

F. Hegelmaier

Tübingen October 10, 1867

(translated from German script by E. Denison, March 1989)

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Acc 2 Dec 3 2
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Tubing 12 Nov 1867

Hochgeehrter Herr Doctor!

Meinen herzlichen Dank für Ihren
gefälligen Brief, und obwohl es mir
Verdruß macht, Ihnen lästig zu
fallen, so muß ich Sie doch bitten,
mir noch einige Fragen zu beant-
worten. Ich habe nämlich Ihre
Arbeit über Cuscuta gelesen, und
finde manches darin, was mir
unklar ist. Ich habe mir
Cuscuta europaea und Epilinum
verschafft, und will nun versuchen
ob ich Ihre Angaben bestätigen
kann. Zunächst muß ich Sie
bitten mir zu sagen, ob Sie
Cuscuta europaea auf Epilinum
gesäet haben, oder ob Sie
Cuscuta auf Epilinum gefunden
haben. Ich habe mir
Cuscuta europaea auf Epilinum
gesäet, und Cuscuta auf
Epilinum gefunden

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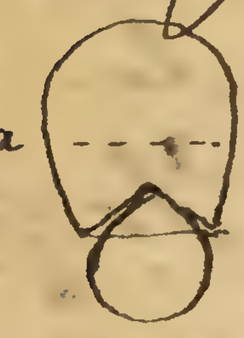

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Nov 1 – Dec 3 – 1867

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ich Ihr verehrliches mir übrigens
entsprechend zu senden. Für
Ihre mir bewiesene Güte bitte ich Sie
vielmals Ihnen danken zu dürfen
Ihrem gefälligen Zuschreiben entnehme
ich Ihre Absicht, die Lorbeerblätter
Ihrer Sammlung einzuverleiben.
Ich sende Ihnen hierbei
einige Blätter von Laurus
Camphora, welche ich
vor einigen Jahren
aus Japan erhielt.
Ich bin nicht
im Stande Ihnen
Blüthen zu senden
da dieselben
nur sehr selten
vorkommen.
Ich bitte Sie
mir gefälligst
mitzutheilen
ob Sie
Blüthen
erhalten
haben
und
ob
Sie
mir
solche
senden
können.
Ich
bin
Ihnen
für
alle
Mittheilungen
sehr
verbunden.

Ihr
ergebenster
Tübingen d.
12. Nov. 1867.
F. Regelmaier.

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Hegelmaier Tübingen Nov. 12, 1867

Most Honored Sir Doctor !

My two letters of the previous month will have , as I hope,, come to you, and also the brochure sent by postal wrapper. Equally I hope,, that you will excuse my somewhat difficult to explain tardiness of the past summer..

As to my essay, it would interest me much, if you think,, that I have looked at your newer shipments (heteropoda and microcarpa) correctly. I at least made an effort to bring the chaos of seen forms to the best of my knowledge and ability into this scheme; should I have lumped too much and specialized too little, you may want to correct this through an adaptation from your viewpoint.. I, in my part,, will have to deliver a postscript some day, not only, because I could not use your last communications any more, but the printer made the matter much too lazy , by ignoring all kinds of insertions, which I made based on a sincere source during proof-reading, and, consequently they are now missing..

Your last sent mixture of Wolffia from Illinois, I finally did examine now; one can really distinguish the two species to a major part under the magnifying glass, after they have been softened sufficiently. W. columbiana does not differ in anything from specimens from other localities. Interesting was for me, to find several specimens, which with all carefullness showed only one stoma. Most frequently I found this with group 3. The other I find (brasiliensis) also agreeing with the one from Detroit; specially in regard to the small (considerably smaller than with our arrhiza) stomata.. The pigmentation is, as far as intensity is concerned, very different,, with some specimens very intensive, as intensive as with the specimens of Weddell originals, with others much more delicate, so that I believe, it never will be missing. You seem to put little weight on this point, and write of individuals totally lacking pigmentation, which I could

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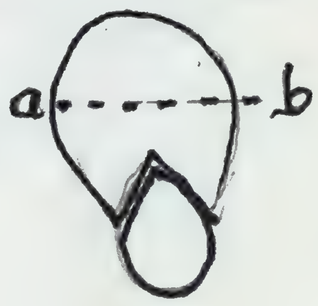
not find in my examinations so far, which, of course were limited in quantity. When pigmentation is quite dilute, it most likely disappears entirely through drying (or being in spirits), whereas with stronger intensity more often it is not being altered through these influences. This I suppose according to the analogue condition of the pigmentation on your Lemnaceae (gibba, polyrrhiza). Did you examine the brasiliensis fresh, and is the pigment of the fresh plant also already brown ?? but not perhaps purple ?. It would be of highest value to get information about this point. Weddell, according to his report,, examined only dried and many soaked specimens, and found the mass of them brown. Still another point: Our arrhiza has an upper surface, which is not level, but strongly domed in cross-direction (a to b), but only in this one, so that a crosscut along this line is edged almost by a circular line. With the best soaked specimens of W. brasiliensis it seems to me, that the upper surface is really flat, however in this I could fool myself easily by the nature of the subject; may-be, you could give information about this, in case you have examined live plants.



The plants in spirits (or, should this be spiritus ? E.D.),, of which you wrote, have not yet arrived. I do not believe, that they have been lost, but that they are being transported slowly.

Lately, I examined much exotic material, in part for the second time, and became much inclined, to describe the Lemna perpusilla pauci-costata as a specific species. I expect already now, though I have not yet examined several larger herbaria, to come to the opinion, to be able, to prove a much wider geographical distribution for the plant (also in Asia and Africa), within which is varies only in insignificant points in some dimensional conditions, without having seen up to now true connecting links with perpusilla (multirostata);

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the latter seems to be restricted to a smaller area, I know it only from the United States from Pennsylvania to Missouri; - Could it be further west or south ? A.Gray says "and southward"; However, I have seen them only from Pennsylvania, New York,, Missouri and Illinois, and none from the true southern states; Never-the-less, I must foregoo, to to differentiate perpusilla and our questionable species from each other without at least half-ripe seeds,, and also not the paucicostata.

There is the question, how the latter may be obtained; I first got aquainted with it through Karsten with a name given by him in a letter, the willingness demands, that, in case it should be described for the first time in my essay, that Karsten retains the authorship,and I would try to motivate Kasten then, to give it another name than Hegelmaieri, which I do not want to publish. Should,however, you describe it in the meantime under any kind of a name, or remark, that this will be done by anyone of your compatriots,,,then I would ask you first, to bring my attention to this. Nothing is further from me, as you may have noticed already, then the chase for authorships.

With the Wolffias from Illinois I found a Lemna, which according to the newest examinations is nothing else but L.minor sterilis. You write once, that, what I consider as L.minor from Northamerica had larger stomata than the europaean minor; I intend to examine the related material some time in that point; but of the now mentioned plants one cannot say this.

I do not have any plant samples to be enclosed this time,. greeting you with highest esteem, Your most devoted

F.Hegelmaier

(translated from German script by E.Denison, April 1989)

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Rec'd Jan 9 04

Tuskegee 19 Dec

Ans Feb 2

(Jahr um 20 Jahre geschrieben)

Mein geehrter Herr Doctor!

Gegenwärtiger Brief soll sogleich
mit der Frage Sie über die Schicksale
Ihrer so freundlichen und verehrten
Familie in Zwickau einige Auf-
klärung zu bringen. Diesen Zweck
wird er wohl kaum erreichen, da
seit 3 – 4 Jahren nur sehr
spärliche und selten, und sehr lückenhafte
Nachrichten von dort kommen.
Selbst die nächsten Angehörigen
sind sich gegenseitig fremd geworden
und unterstützen sich nicht.
Gewiß ist nur, daß Lehmann und Wolfin
Volontär und St. Louis. In
der Familie Wolfin ist eine neue
Hoffnung. Sie ist jetzt ganz
in Anspruch genommen durch
ihre Kinder, und ihre Lage
ist eine sehr traurige. Ihr Mann
ist immer ein Opfer seiner
Leidenschaft, und sie ist ganz
allein. Ihre Eltern sind todt,
ihre Geschwister in alle Welt
zerstreut. Sie ist ganz
mit ihren wenigen Kindern
hier. Mit Ihnen zu correspondiren
ist ihr eine Freude, aber
auch eine Pflicht, der sie
nicht nachkommen kann.
Ihre Lage ist eine sehr
traurige, und ich kann
Ihnen nur rathen, sich
in Ihr Schicksal zu fügen.
Ich bin selbst in einer
ähnlichen Lage. Ich habe
meine Eltern, meine Geschwister
und meine Heimath verlassen,
um mir eine Existenz zu
gründen. Ich habe mich
auch verheirathet, und
habe Kinder, die mir
viel Freude machen, aber
auch viel Sorgen. Mit
meinen Verwandten
bin ich ganz
allein. Ich habe
keine Correspondenz
mit ihnen, und
wünsche auch
keine. Mit Ihnen
möchte ich
gern
correspondiren,
aber ich
habe
nicht
die
Zeit
dazu.
Ich
bin
so
sehr
in
Anspruch
genommen
durch
meine
Kinder
und
meine
Schule,
daß
ich
kaum
Zeit
habe,
meine
Briefe
zu
schreiben.
Ich
habe
die
traurige
Pflicht,
Ihnen
zu
sagen,
daß
ich
jetzt
ganz
allein
stehe
in
der
Welt,
und
daß
ich
mich
nicht
um
Ihre
Angelegenheiten
kümmern
kann.
Ich
bin
sehr
traurig
darüber,
aber
ich
kann
es
nicht
ändern.
Mit
herzlichen
Grüßen
bin
ich
Ihre
ergebene
Nichte
Clara
Hinrichs.

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Hegelmaier
Rec. Jan 9
Ans. Feb.2

Tübingem, Dec. 19,1868
This could be 1867 ? E.D.

Most Honored Doctor !

The present letter serves primarly, to let you not any longer in doubt about the fate of the friendly and valuable shipment in alcohol. It reached me 3 - 4 weeks back from Frankfurt,and I pronouce my most devoted thanks to you.

All arrived in good shape; opened and examined until now are only the little glasses with the mixture of Lemnae and Wolffia columbiana from St. Louis. To the others I will get only in the New Year, because I like to get into an object thoroughly once I get to it.

I am therefor not in position, to make many remarks about the items,thus only this, that the questionable Lemnae - in that respect I have become finally confirmed - are certainly identical with our europaean minor. We have equally robust and still more robust forms. The carina in the middle line of the upper surface has also the europaean minor. The carina on yours was at first view somewhat dumbfounding In the size of the epidermis cells and a related measure of the|inter-related size of the stomata,there is no difference from our normal europaean forms. One can however not use this last point as a diagnostic characteristic, as I thought for some time. I have now slowly made a lot of measurments on a mass of forms,and, from this results indeed, that (what becomes fast apparent)L. minor has generally smaller stomata than other species,specially the perpusilla, group, however, there are remarkable exceptions from both sides,so that in the extremes of both sides the dimensions overlap/. Even less could L. perpusilla and our maculosa resp. paucirostata be separated on the basis of only vegetative characteristics...

L.minor and perpusilla are certainly in their mutual relation so different, that they are,what one calls "good species"; every sytematician, who examines them carefully,will declare for this..

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And yet,I have become aquainted in recent times with some few forms (specially one in the Vienna herbarium,which I had to use one of these days), which caused me unending headaches (in German "head-braking" E.D.),until I decided to accept the supposition,that here was a form with characteristics of both species, thus a connecting link.The form comes from Ohio (Gregg) . The shape of the fruit and the direction of the seed as most important characteristics ties her rather to perpusilla,even though in this point approximation to minor exists. Paucirostata can not be in the picture here,as it is ~~not~~ much more distant from minor through the structure of the seed..

You wrote earlier some time, that you had so much material of Wolffia, that you could provide all collections in the world. If this be so, I take the liberty to recommend the K.K.. (königlich & kaiser-liche-(royal and imperial) E.D. Viennese Hofkabinet and the K. Berlin herbarium at some time for consideration. Transmittal (specially to Vienna, with which you probably are not in correspondence,I could undertake. Plants immersed in alcohol are not suitable for drying; Both named collections possess neither W.columbiana nor W.brasiliensis, only of the first do I find a number in the Vienna collection, little plants,found by accident, under L.polyrrhiza,of which it is uncertain if they are from Ohio or New York..

When I sent you L. trisulca - I believe it was last Spring - I had only a few, as I could not find a party, which believed to possess it. Recently ,the matter has been resolved,. wherefor I enclose further material.. One finds the plant in collections,and we have also flowering ones; in those used by me so far they are not present,or only in single fronds.;

I hope, that my earlier letters from past autumn have come to you,.

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I have no report about them, and would not know,how to encourage you otherwise, to do so.

With best greetings Your most devoted

Dr. Hegelmaier

Tübingen
December 19, 1868

(translated from German script by E.Denison, April 1989)

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Rec'd Febr 10

Tübingen Jan 17 1868

Hochgeehrtester Herr Doctor!

Mit Ihrem gütigen Schreiben vom 7ten habe ich mich sehr gefreut, Ihnen wieder einmal Gelegenheit gegeben zu haben, mir Ihre Freundschaft zu beweisen. Leider bin ich genöthigt, Ihnen zu gestehen, daß ich Ihre Erwartungen nicht erfüllen kann. Ich habe mich nämlich mit meinen Untersuchungen über die Entwicklung der Gefäßpflanzen so tief in die Materie hineingearbeitet, daß ich mich nicht entschließen kann, dieselbe vor der Hand zu verlassen, um mich einer Arbeit zu unterziehen, die mir nur wenig Ausbeute für meine Lieblingswissenschaft, die Botanik, versprechen würde. Ich habe mich nämlich in letzter Zeit mit der Untersuchung der Gefäßpflanzen beschäftigt, und zwar mit der Absicht, eine Arbeit zu liefern, welche mir einen Platz unter den Botanikern sichern soll. Ich habe mir zu diesem Zwecke ein Thema gewählt, welches mir Gelegenheit bietet, meine Kenntnisse in der Botanik, Physiologie, Anatomie und Entwicklungsgeschichte der Gefäßpflanzen zu verwerthen, und welches mit den jetzigen Fortschritten der

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[illegible] Sporen [illegible]
für die Wolffia [illegible]
Chromsäure [illegible] Monate [illegible]
Entwässerung [illegible] Alkohol [illegible]
Einbettung [illegible] Schnitte [illegible]

Wolffia arrhiza Mittlere Sporenlänge
Sporen mit [illegible] Sporenlänge von
Entwässerung. Mittlere Sporenbreite
Einbettung [illegible] Sporen von 0,0342 – 0,036
Schnitte [illegible] Sporen — — — 0,0342 – 0,038.
Sporen von [illegible] (Normalität) 0,038 – 0,04.
Chromsäure

Wolffia borealis 0,021 – ~~0,028~~ 0,0228
" Illinois 0,019 – 0,025.
" Rocky Grove

diese Zellen [illegible] alle [illegible]
[illegible] Sporen [illegible] Mittel [illegible]
[illegible] [illegible] [illegible] [illegible]
Mittel [illegible] Sporen [illegible]
Mittel [illegible] Wolffia [illegible]
[illegible] [illegible] [illegible]
[illegible] [illegible] [illegible]
Wolffia [illegible]

Hier [illegible] die Lebensweise
Vorkommen [illegible] Jahreszeit [illegible]
[illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible]
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MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

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Rec= Febr 10 1868

Durch Ihre mir gütigst übersandten Separat-
abdrücke sind Sie mir schon
vielfach nützlich
geworden und ich bitte
Sie deshalb meinen
wärmsten Dank
entgegen zu nehmen.
Ich habe mich
nun auch an die
Arbeit gemacht
und
Sie werden
mir
gestatten
Ihnen
meine
Resultate
mitzutheilen
sobald
ich
mir
einige
Gewissheit
darüber
verschafft
habe
ob
Ihre
Ansichten
über
Cellulose
und
Stärke
auch
meine
Billigung
finden
werden.
Ich
bin
augenblicklich
mit
Untersuchungen
über
die
Entstehung
der
Stärke
im
Chlorophyll
beschäftigt
und
hoffe
in
Kurzem
einige
Resultate
zu
erhalten
welche
mir
vielleicht
auch
für
Ihre
Arbeiten
von
Interesse
sein
werden.
Mit
der
Bitte
mich
Ihrer
Frau
Gemahlin
bestens
zu
empfehlen
bin
ich
Ihr
ergebener
Dr. med. et chir.
und
Privatdocent
Tübingen
17. Feb. 1868.
C. Nägeli

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Hegelmaier
Rec.Feb.10

Tubingen, Jan. 17,1868

Most Honored Sir Doctor !

Because the matter has some urgency,I annouce to you the arrival several days ago of your letter, before I sstudied its contents., and can discuss it. Be convinced, that it will be studied and evaluated with all conscienciousness. In the meantime my heartiest thanks for everything:: for the plants, for the valuable contributionn to my albumm of scholars, always a constant patron and advisor of my small efforts,and,finally, for the esteemed remarks about the life of the Lemnaceae in your area. My last letter, in which I announced the receipt of the plants in alcohol,crossed in the meantime with yours,and will have arrived about simu ltaneously with yours. I want to answer now your youngest questions before you trust yourself to the atlantic ocean, as far as I am able for the moment,respectively add some from my side.

Lemna trisulca The sterile sprouts are always without stomata, whereas the flowering ones develop some in modest number on their surface, which has been known a long time. You will find them the most likely on the base part ((i.e. that, which forms the pockets from which the sprouts emerge); there, they are never absent, are however not always seen easily due to their small number. On the lower part they are generally even fewer.

Lemna melanorrhiza is indeed closely related to polyrrhiza, a Spirodela; I knew it already a long time prior to the description in the Journal of Seeman.

Wolffia Welwitschii I compared with polyrrhiza only as to size (i.e. extension of surface not thickness) and not as to formm in order to provide for uninitiated ar least some idea about the approximate dimensions as unusual for a Wolffia("magnitudine quod latitudine et longitudine paene cum L.polyrrhiza comparandae"). The form is

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entirely different.

Wolffia arrhiza My stomata measurments agree with yours almost exactly. Small specimens from Leipzig had those from 0.0342- 0.036

robust ones from there 0.0342- 0.038

those from Caen(Normandy) (very robust) 0.038 - 0.040

Wolffia brasiliensis, Illinois 0.021 - 0.0228

from Matto Grosso 0.019 - 0.025

These values harmonize all more with yours than Weddell, and I believe for this reason, that he gave somewhat too small measures. Weddell's work contains by the way much of excellence.. I have not yet compared the fruits of these two Wolffias, but will undertake in the fall another comparative examination of all Wolffias. What you write about the modus vivendi of W. columbiana does tie in with the small number of stomata and the image, which one must form a priori by her need to swim.. Karsten communicated something similar to me upon questioning but not clear and definitive.

Lemna paucirostata Concerning the difference in the epidermis with perpusilla, the specific examination will have to wait, as I have not yet had the time. In the Berlin herbarium, in case, you are ~~you~~ to consult it, it exists from Ceylon (Thwaiser), from the east-indian continent (Morker),, from Japan(Wichura); I also have it from..... .....thus it is very well distributed, considering, what is known 'til now of perpusilla. I also include hypothetically sterile ones from Java, Polynesia etc. Those in the Berlin herbarium had been designated from the very beginning as L. minor. In part they were typed by me at the first, hurried perusal; later I ~~will~~ dealt with the collection once more and discovered my errors, but have not yet corrected them, because I plan to wait until the plants would have a name.

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What
~~Waht~~ concerns that, I have mentioned earlier,that, if I had described them first,,I would have asked Karsten for a name,because some people put value on such matters,which, however, I hardly believe of Karsten.. If you too describeL. paucirostata,that too would not do any damage, as for me such matters have little importance.

I hope to get the seeds to germinate in spring,if they should not have suffered through pressure, drying should not have been harmful. I let the seeds of L.gibba germinate after dry storage of several weeks, and it is otherwise known,that they can be stored over winter. After all I know about the nature of their habitat, I believe, that this process is often of benefit to the plants, i.e. they can tolerate the drying out of their habitat without perishing.Entirely the same you find with your american species. On the other hand,exact observation proves, that L. gibba vegetates over winter, as do certainly trisulca and minor.- I was not able to observe them in the local area ~~xxxxxxxxxxxx~~,and my trials to bring them in (? E.D.) failed. This goes against the culture requirements of Lemnas,which I know closer..- If yours winters in brackish places through seeds,. there does not follow with necessity, that there is not enough water,but, perhaps, that it is not warm enough for germination.Thus, the question should remain open,and, at least, several possibilities are involved. The Wolffia by analogy with W. arrhiza in Europe could at least overwinter.

My special thanks about your information about pigment & shape of W. brasiliensis. The last point I can now examine myself.

What you can expect in the spring in Berlin, was recently communicated to me too.. Should your son choose a vacation sometime in the Black Forest (Schwarzwald) or the Swabian Jura (Schwäbische Alp), or our Bavarian Mountains (Algeu),your itinerary leads you by

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way of Tübingen and a stay with us. I am really also Dr. med. & chir, and past doctor.

Callitriche I know from Japan, and that in a form, which I could not separate from our vera, as I have mentioned this.

And now I wish you with all my heart a good trip and fast passage. Thanking you again and with greetings, Your

F.Hegelmaier

Tubingen Jan. 17, 1868

(translated from German script by E. Denison, April 1989)

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Rec. April 13 1868

Answered by Dr. Torrey

Dear Sir, I beg leave to send herewith specimens of the latest species which I have received from Dr. Fendler, and which I have named as follows, viz:

Cassia Fendleri, Gray
Cassia Wislizeni, Gray
Cassia Lindheimeri, Scheele
Cassia Roemeriana, Scheele
Cassia Chapmani, Gray
Cassia Texana, Gray
Cassia Lindheimeri, Scheele
Cassia Roemeriana, Scheele
Cassia Chapmani, Gray
Cassia Texana, Gray

I have also received from Dr. Fendler specimens of Cassia Lindheimeri, Scheele, Cassia Roemeriana, Scheele, Cassia Chapmani, Gray, and Cassia Texana, Gray, which I have named as follows, viz:

Cassia Fendleri, Gray
Cassia Wislizeni

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Ich habe einen Agaven-Bastard bekommen, der
mir wahrscheinlich 3 bis 4 Jahre Geduld
kosten wird. Ich bin mir wegen
verschiedener Gründe nicht
sicher ob ich Ihnen mit Vergnügen
Samen schicken

Wenn Sie haben wollen, so
schicken sie mir gefälligst Ihre
Adresse.

Ergebenst
A. Regelmann.

Cöthen
d. 20. März 1888.

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Hegelmaier
Rec. April 13,1868

Tübingen, March 20,1868

Most Esteemed Doctor !

Though I let pass the deadline through prolonged postponement, which you had set in your last letter of Feb. 2, as advisable for a letter, however may-be the present lines will still reach you, which I believe the more, as it was to be concluded from your last but one letter, that you have postponed the time of your departure already once.

I forgot to write earlier, that I would be able with pleasure, to send to any place in Germany samples in alcohol of Lemna gibba and trisulca floresc.,L.minor c.fl. & fruta,also Wolffia arrhiza, if this would be of service to you. Trisulca in fruit I do not have myself; In 1866 I achieved ~~about~~ fruits after getting them to flower in room culture,which I used in part for germination and in part for dissection, I can thus say only, that I can not declare any difference in seeds from the otherwise so dissimilar L. minor.

I am much more obliged for the last shipment,though the items were sterile,than you seem to think, ~~xx~~ which ~~xxx~~ gave me some information.Thus ,one of the numbers I ∝ of L.polyrrhiza seems to prove,that this plant over-winters there, in a warmer climate, different from ours. Do ~~the~~ your Wolffias overwinter on the water surface in your room ? In Europe the L. arrhiza winters by a winter-sprout,which sinks to the ground, and does so for several years also in a daily heated room; most likely this will not be the same for each latitude. - Your perilis (or perilia ? E.D.) prospers, sec 2 ∝ the Californans seem all to belong to L. minor, equally so L. Torreyi from New Mexico (Gallejo Spring). I am at present involved, if L. Torreyi should retain its name or ~~not~~ if an older one does exist rightfully,a question, which came to my attention only this winter through viewing of your material, and which causes me

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all kinds of scruples,considering the weight which some put on such problems of nomenclature; I, also, became only last winter aware of several striking,unfortunately sterile,forms of Lemnaceae (I can't even determine the genus definitely),one of which you have prof. Braun show you (from South Africa ?),, and I am convinced, that by further delaying my work,I not only could fill in several known gaps and also augment my notes, but also may become aquainted with more unexpected forms;. But I am nevertheless determined, to now come to a preliminary conclusion,and to complete the text in the just begun spring vacation. Your alcohol preparations have just been dissected in the last weeks,and in part I present their fate here.- I certainly did receive from you Callitriches from California, and did probably annouce their receipt to you. They have been referred for research so far, until some more will augment them.. I have ordered the new edition of A. Grey, and am curious about it. W.brasiliensis also shows some differences in the inner structure from the arrhiza ,i.e. the material of it,which is available to me; if this is oorrect for all forms, is, of course, a big question. The back-surface is less raised with brasiliensis than with our arrhiza. The simplest and least perfect structure is definitively the columbiana. Her back surface is almost arched in the same degree (but not quite the same) as the belly-surface (this is a verbatim translation,E.D.),and thus nears the form of an ellipse very closely. Its texture is much larger-celled than the two other species,and ~~it~~ cue can hardly ~~xxxxxxxx~~ comprehend how this conglomerate of very limited mass of celles can bring a relatively large seed to ripeness, which, according to Karsten, does really exist,and seen by him,but, in its parts was wrongly interpreted.. I just remember, that I possess a separate prin -

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ting,which I do not need, and that I also have the journal. If you will tell me, where these should be ~~sent~~ sent, I would be gladly of service.

But now, stay well, I heartily wish you a happy trip,

Your devoted

Dr. Hegelmaier

Tubingen,
March 20,.1868

(translated from German script by E. Denison, April 1989)

Berlin 19 15
Gen — 20

H

Anregungen für Arbeit

die Pflanzen welche Sie die ganze
gehabt haben durch Anmeldung bei
Herrn Prof. Braun mir zugehen zu
lassen sind gestern angekommen, ich
werde aber erst am morgigen an an
fangen können sie genauer anzusehen.
Einstweilen meinen herzlichsten
Dank! Ich darf mir vielleicht er
lauben, Ihnen Callistrüsen und
die Wright'schen Lemnae etc.
8-10 Tage für zu behalten, ich
möchte sie bei einer Durchsicht und
mit der Mikroskopie wenden die
doch nicht so ganz ohne weiteres
Pflanzen ist die auf den Mangel
irgend eines Merkmales beruhen
den angeführten Fällen ganz Ihnen
es Ihnen noch einmal einen Dank
vielleicht nicht einmal zu Die gelungs
Pflanzen und ins Wasser zu thun. Ihnen
arbeitung Ihnen von Nutzen für die
darauf Jahre Jahr, abhängt Lemnae
die Früchte (Körner, Sitz.) an einem

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[illegible] einen [illegible] [illegible]
[illegible], [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [

Volle 4 Exemplare und
verschiedene Formen-Beschreibungen
wünsche für mich besonders sehr
zu wünschen, muß die 4 Exemplare
dieselben jetzt selbst schicken
können.

Die Arbeit scheint ausgezeichnet
Summarum. Lepersonelle
Leben nicht genügend Formen
sind Einheit zu Grund ge-
gangen.

Aber und wie ist noch seine
Ansicht über die Species
Arten? Sind sie und welche Beziehungen
existiren zwischen ihnen, namentlich
in der Gegend von Halle? Welche
Arten kommen hier vorherrschend
oder gegen die Arten
Ihres Gebiets kommen sie vorherrschend
die für mich wenig Interesse
haben. Ihren einzelnen
Individuen Daten. Ihre Angaben
Ihrer Daten sind klug für
Gute Arbeiten, aber nicht sehr
Interessant wie genügend, da man
immer in der Lage sein soll neue
in der Literatur zu kennen.

Ihr ergebener
Dr. Engelmann

in Leipzig mit Grüßen an Ihre
Frau Mutter? Ihr Sohn hier ist

Jemand als Lumeran a
Asbis für Jücan in
Wichsen Krüger gesprochen
Anerbieten angebracht:

In Ermangelung Ihres Antrages
in Berlin Affinität Ihrem Lieferanten
Preis entsprechend Ihrem Preis
Antrag) an Ihrem Preis mit resp
anderen Werk vorzugsweise oder
Ihrem Preis mit Ihrem Preis,
Ihr Interesse Ihrer Preis Ihrer

Ihr

ergebenster
Tübingen, 17. Juni 1868. H. Hegelmaier.

Ist Ihnen von der Firma Hilsen
Ihren Antrag mit Ihrem
Ihrem Preis?

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

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Hegelmaier
Rec. June 19
Ans. 20

Tubingen, June 17,, 1868

Most Honored Sir Doctor !

The plants, which you sent to me through Prof. Braun arrived yesterday, bu I can only begin tomorrow, to examine them more ~~exactly~~ thoroughly. In the meantime my heartfelt thanks ! May I take the liberty, to keep your Callitriche and the Lemnae of Wright for 8 - 10 days here. I would like to look them over somewhat, and the return trip may not be in a hurry, at least I conclude this from the absence of any indication about this.

During the past spring I wrote you still another letter,, which perhaps did not reach you any more, in which I and Arschner (?) proposed, if this would have any meaning to you, to send flowering Lemnae in alcohol (trisulca, gibba) to a locality to be chosen by you in Germany. To the completion of your trip, for which I then wished you good fortune, I can now congratulate you. The Wolffia little bottle arrived also well with the last package, and will be of much use still.

Your notes and drawings concerning Wolffia, I have observed with great interest, but, until now, only superficially. As far as I can determine until now, I shall at the return have only one di - verging interpretation for the figures..

During the last months some sterile forms of american Lemnae have given me very severe headaches, and probably I may not come to a certain result, as long as nothing fertile of this is discovered. They were named by Philippi L. minima (as it seems, he thinks they are L. minuta Numbi) and have through absence of 3α in the sprout the most similarity with the valdiviana Phil (L.Torreyi, Austin). The name of Philippi is unfortunately a few years earlier than blicus (???? E.D.) , though with a description, which,

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lets one guess at almost anything but the plant in question, (were it not for the several originals distributed in herbaria) as which I mention it in the beginning, though I am less than convinced about her identity ~~with her~~, but lelieve, that a definitive species is involved, which perhaps may become known only after an inspection of flowers and fruits. In the Berlin herbarium is L. minima Phil, and L. valdiviana, Phil; of the latter I enclose an orignal sample for you. Some northern numbers (from California by Bolander) stand in a way in the middle, however, these sterile ones can bring one almost to desperation ; any firm ground is missing, and yet, I am glad to get again and again such forms for examination. Thus, I believe to be able to distinguish L. perpusilla and paucirostata sterile by their root-division (this could be "root-disk", German either Scheide or Scheibe, E.D. ??).

Prof. Braun has a very charming Lemna in his herbarium, which I have named a sterile Wolffia lingulata. The W. oblonga (Lemna oblonga Phil.), enclosed for you, is her closest known relative, she is distinguished from the real Wolffiae in very important way, (a dissertation here would go too far) is up to now known only sterile, but offers vegitatively outstanding forms. Her addition to Wolffia can only have preliminary worth, and cannot be predicted until sometime fruits will be discovered.

If the magnificent and valuable collection of Juncus be really destined for me, I would not know, how I could prove my gratitude for it now.

The seeds of L. perpusilla, sown this spring, did not germinate, but perished unfortunately.

Who and where is that Mr. Wright, who made the fine Cuban collections, and would in not be possible, to obtain from him through

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purchase or for printed matter such items, which for me have monographic interest ?? Of specific items I have samples through your kindness, but, as a monographer one has never enough, as one should be able to make further examinations..

May Mr. W. Engelmann in Leipzig be related to you ?? I offered him the treatease on Lemnae for his publishing house, which is highly esteemed in many circles..

Not knowing your address in Berlin, I mail this letter to the address of Prof. Braun, to whom I take the liberty to write also tomorrow or the day after. With highest esteem Your devoted

Dr. Hegelmaier

Tubingen
June 17, 1868

I possess only very small samples of the two epidermic items !

(Translated from German script by E. Denison, April 1989)

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Berlin 30 Juni 1868
Am Tage

Hochgeehrter Herr!

Herzlichen Dank für Ihren Brief!
Ich sehe der schönen Tage zweier
angekündigten Herren mit gespannter
Erwartung entgegen. Ihren Besuch
werden wir ganz besonders zu schätzen
wissen. Ihre Pflanzen sind sämmtlich
und Ihnen sich die jetzige bekleidet
den Moment günstig gefunden werden
sich gütig wünschte einige von den
Collectionen = Nummern gegen die
Sorte sie noch einmal durch
sehen zu wollen ich will alles
für sie noch thun zu behalten.
Ich habe durch Ihren letzten Besuch neue
Lebenslust und Ausdauer gewonnen
sich die Hoffnung ich werde
andern müssen. Nannen [illegible]
ich mich Ihrer Freundschaft noch ferner
nicht unwerth lassen. Ich

Jetzt ist mir übrigens müssig
das ist Ihnen übersichtlich
wie ich grundlos Blumen gehen
Jetzt in den Kasten zu nennen
Lazarus Kästchen ist für ihn von allen
andern Dingen abhanden verschieden
und ich stehe nun selbst auch
schmerzlich den Mangel empfinden,
denn Sonne und Sinn
gehören nicht Dinge selbst andern
Dinge Namen.

Machen Sie mich selbst durch
Leben die entsprechende und über-
wissen Seiten zu beschreiben
und abzeichnen Wünschenswerth
ist), als sie bald geschieht
hat ich es - mir gleichzeitig Jemand
aber in Länge ich Interesse ab
gegen - Nähe - in ganz klar
den Artikeln Ihnen, Material
zu andern abspalte ganz klaren
Artikeln Punkte wie vielleicht
die wir selbständigen und Stile-
wissen Formen abgenommen
in Lagen zu unterscheiden. Alle
aber ich Mühe über die wissen

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Hegelmaier
Rec. Berlin June 30
ans. July 17 ?

Tübingen June 28,, 1868

Most Honored Friend !

Heartiest thank for your letter ! I searched through the package, which arrived several days earlier, several times, looking for some lines from you, but apparently no such were enclosed..

Your items have been thoroughly examined, and can at any moment be returned, but I desire to re-examine some of the Calli - triche items once more in the fall, and thus, I take permission, to keep all for now here. I learned through this occasion of new forms of that genus, and it seems to me, that the creation of one or the other new name can not be avoided, though I object as much as possible against this.. I also had to convince myself,, that I had done totally wrong to your C. (here is a blank in the text, E.D.) microcarpa in the postscript to my last essay; it is different from all other known ones, and I can state the circumstance only for half an excuse, that I did not have before a properly ripe fruit for examination..

Should you not yourself desire to describe the californian and cuban items, and as this would be desirable, I cannot do this now suddenly, but could do it during Fall toward New Year in quite short articles; Material for also quite short articles will perhaps come from the forms from New Holland and Chile, which I examined lately. Should the note about the californian (or cuban) be suitable for your St. Louis dissertations, I would make them available in the future,, because they are entirely written in Latin or German, and I would not want to compromise myself by translating them into English..

In the issue, provided some time back, of your transactions I find explanations about the majority of your beautiful junci;

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I also own a new edition of A.Grey. where also most of them are described. To the latter, as I am told, there are supposed to exist supplements instead of an unchanged full edition, of which you spoke earlierMy local bookstore could not provide these until now,but I own the supplement dealing with the Lemnae in hand copy..

About the recently mentioned point of the synergid, I may not have expressed myself exactly, and thus was not understood correctly by you. I do not have the slightest doubt about the complete identity of Philippi's specimens, his L.valdiviana with Mr.Austin's L.Torreyi,. and was, as far as I anteceded the last designation,corrected by the next (not examiner but) compilator. In contrast, there exists another (named by Phil. L. minima and only known sterile) form,of which I believe, that it does not belong to any of the others,also not toL.Valdiviana = Torreyi,though it does seem to have relation to this.. This L. minima,at least seems to belong to it,exists also inthe western North America; I am just in the process, to go over the revelant numbers to the best of my ability..

Again thanking you vor your multiple communications and gifts

Your most devoted F.. Hegelmaier

(translated from German script by E. Denison, April 1989))

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Hegelmaier Tübingen, Nov. 21, 1868

Most Honored Friend !

I take the liberty to mail to you enclosed a copy of the printing with the request for your kind judgement. The second is for Mr. Austin, to whom I am indebted, and the third I ask you to give to any of your american compatriots who may use it, who could possible aid the cause in the future in the hope, that he could provide some material. You will best be able to make the selection.

Your Callithriche are still in my hands, will however be sent off before Christmas. I am in the process to prepare a small essay about this subject, in which I have been much interrupted through other business.

Concerning the Lemnaceae, the californica could deserve further observation in the future. As in Chile and Mexico, there will probably Wolffiella be found in California, either the same or other forms. Your notes, which I have used and your Cuban Lemnacea (W. Welwitchii c.fl. et fruto immat.) follow already now.

With most devoted thank, for today in a hurry, Your

F. Hegelmaier

Dr. Gärtner made me happy with your greetings from Bellagio.

(translated from German script by E. Denison, April 1989)

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Berlin May 27 16

Ay — — 30

Hochgeehrter Herr!

Ich bin mir wohl bewußt, Ihnen durch
Schweigen und Stillsein jetzt in
hohem Grade unhöflich zu erscheinen
allmählich an der Zeit, Ihnen
in meinem ganzen Umfange
Ihnen gehörigen Personen
meine Gedanken zu enthüllen. Ich bin Ihnen
vielleicht abermals Ihre Geduld
anbringen bis wissen Sie mir
einen Ausweg in meiner Zeit
im Raumbruch Freiheit verschaffen
Ihnen wenn Ihnen meine
Ihr gewissenhafte und Ihre Zeit
Ihr Landsmann Warburg so recht
Stunden zu allmählig kommen
lassen. Mit Ihr von Abbruch
für Amerika zu können
wird Ihnen Dr. Hoffmann in
Berlin abgehen? Ihr Abgang

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Hegelmaier
Rec. Berlin May 27
Ans. May 30

Tübingen, Jan. 21, 1869

Most honored Friend !

AsI imagine, that yout return trip from Italy will soon take place, it is about time, that I return those items belonging to you,, which are in my hands.. That I am again obliged to you deeply, you will see from a small essay, which will be completed in final print in the near future, wherein your items besides several others have been used,, as consciencious and well as I was capable; The systematic treatment of this genus remains difficult, but will become the more possible, the more forms one becomes aquainted with by and by. What you may use in America of copies, Dr. Ascherson will deliver. Complimentary, of course, to this is the prior essay, of which I have left a conside - rable quantity, which is with pleasure at your service, if you have any use for it.

I send simultaneously mexican duckweeds (the German word translates "water-lenses" E.D.), primarly a mixture of various, which I have identified lately. New of these are only some deviating forms of Wolffia ligulata , mostly smaller than previously described and illustrated; the one designated as L. valdiviana var. abbreviata is a form,, which is very similar to one received from you from New Mexico (Gallijo Springs). Between this and the longish L. valdiviana typo (s. L. Torreyi) exist, on the other hand also many between the abbreviata & the still shorter L. minima Phil., as far as one can judge from vegetative characteristics. (this sentence is not complete, E?D.)
As long as this one does not exist in California and L. minima gets collected in fertile condition, and thereby effects perhaps a dif - ference, I do not know, what to do with it,, other than to line her up.

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In North America there is promise yet specially in California and the other territories bordering Mexico,may-be also the Southern States for interesting material.. I believe to have provided hope for future contributions, as I continue to take all possible steps in other directions.

Your return from trip ~~to~~ Europe is probably not so close, that I should wish you already a happy voyage. Thus, in the meantime I greet you with highest esteem

Your most devoted
F. Hegelmaier

Tubingen
January 21,1869

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Hegelmaier Rec. June 3, Berlin Tübingen June 1, 1869
Ans. " 19

This is a fragment of a letter to Dr. G. Engelmann,
original pages 1 and 2 are missing. E.D..

..... could perhaps be of use, as, quite generally, I permit myself the request, to make use of my possible services concerning the giving of information..

And now I take permission to pronouce a few wishes on my part..

1) You wrote to me earlier, that you had seen Callitriche Austini from Bahia. Could you not provide me with a fragment for viewing after you have come home ? I am supposed to work on the group for the Flora Brasiliensis, and though I do not doubt the diagnosis in the least, I should have for this purpose the autograph . I have not found the plant in question in any collection, not even in that of Martinus. In connection with researches instigated in Brasil for the purpose, I received recently from Rio de Janeiro the Lemna paucicostata. If you should get in the future, to again examine the latter, direct your attention to the wings on the vortex of the roots, normally on the sprouts of young, half-grown plants. These wings are one of the strangest characteristics for the species on which they occur (perpusilla, paucicostata, and angolensis) and, in addition, a superb characteristic for the group formed by these as against the minor on one side and the forms with a one-nerved sprout on the other..

In connection with the examination of some of your specimens in alcohol from you of L. minor from St. Louis, I, finally, found one with flowers; I took out the ovulum, thus eliminating any possible doubt about the correctness of a north-american minor and that belonging to the Old World..

2) Could it not be possible, to obtain a specimen of the beautiful Lemnaceae of Wright from Cuba, as I saw them in your collection ?

3) According to an ad appearing some time back in the botanical newspaper, Mr.

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Bolander sells plants from California. The price is not quoted there; could this not be determined ? I would not mind to buy some, as one could hope, that even in such a collection.which interests me specially,, genera would be properly considered..

4) Is there not in America a bryologue,who would be inclined to barter ? I have worked on this special area in my leisure hours, primarly on my vacations, and own therefor some of this from South Germany and Switzerland, etc; I would be rather sure of diagnosis, as I am able to use the council of the best experts, such as Schimper and Zuwetzke,if, as happens here and there, there are dubious cases..

But now enough for today. Greetings from your most devoted

F. Hegelmaier

Tubingen June 1, 1869.

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Acc[a] June 23[d] Berlin 1769
den Sept 27 [illegible]

[illegible]

[illegible] gab ich 2 [illegible] Schreiben, an
meinen [illegible] und vom [illegible] Diener
[illegible] für [illegible] mit, wird noch in 5 – 6
Wochen [illegible] zurück sein, aber an den
[illegible] [illegible] [illegible] [illegible] –
[illegible] [illegible] [illegible] [illegible] [illegible],
[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible]

[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible] –
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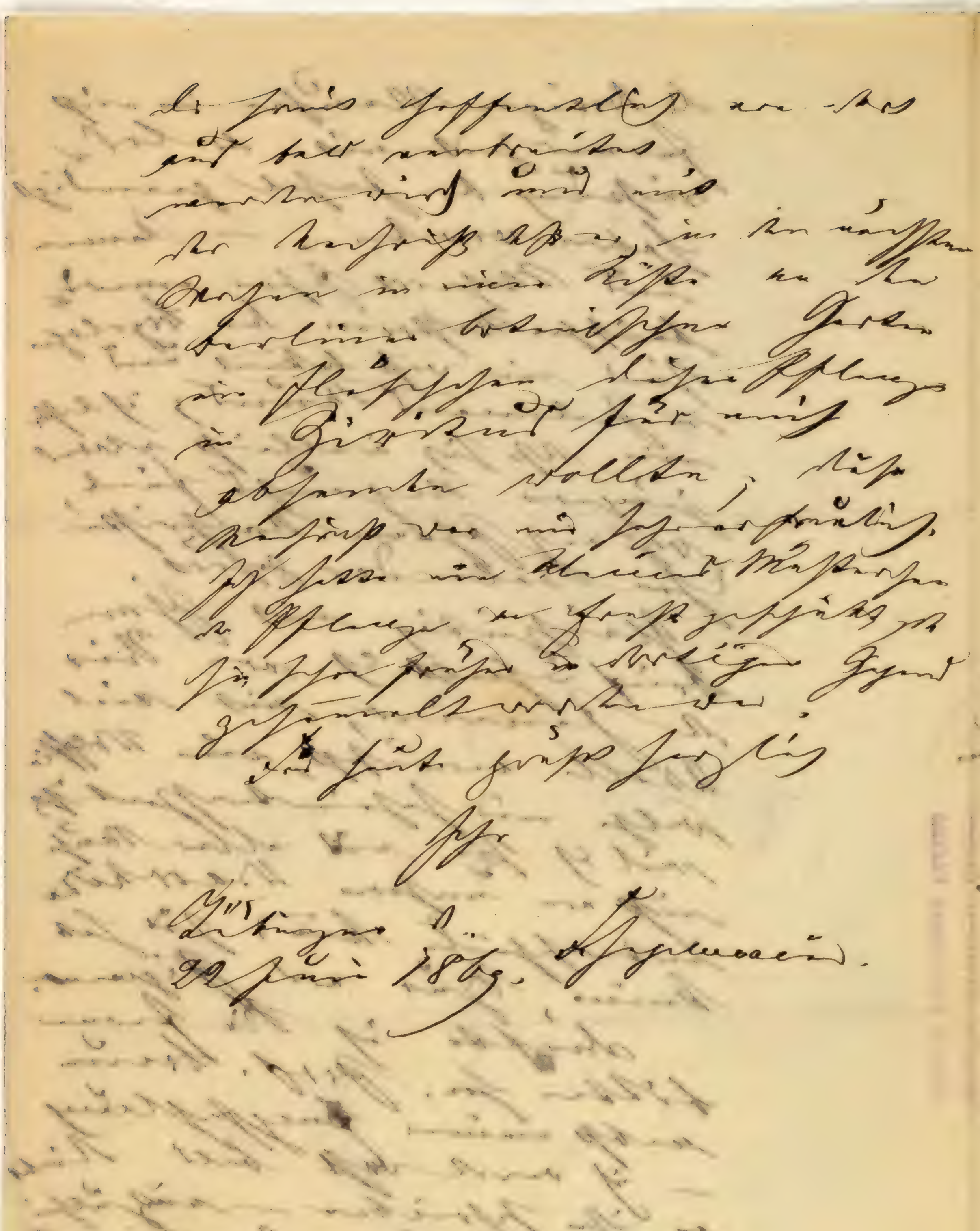

Dr. Engelmann

Hegelmaier
Rec. June 23, Berlin
Ans. Sept.27

Tübingen June 22, 1869

Most honored Friend !

Yesterday I gave ~~two~~ two local catalogues from the past and the current semester - the one for the next one will only be distributed in 5 - 6 weeks, but will hardly be different from the first, to the post. Here still a few remarks in reply to your friendly letter.

If it should come to a visit of Mr. med. student ~~of~~ to Tübingen, I would - ceteris paribus - and besides the other regards possibly important for you - council for a transfer in spring rather than in fall, because strangers adjust easily in the summer half year in the beautiful area, whereas in winter the contrast between metropolis and small city becomes doubly apparent. I will be delighted to make his aquaintance sooner or later here.

Too bad, that we are situated 2 hours of railroad travel sideways from the route between Munich and the Rhein, and have no hope, to see you here this summer.

I thank you best for your multiple information. My requests and questions were really calculated primarly for the time after your return to America, which I thought to be somewhat closer than it is. Such a one is the one about Callitriche ~~Bechtini~~ Austini ? 2α from Baku; the related note is in a letter from you, dated January 31, 1865 - It must have been one of the first collections, which you looked through, and you wrote then: "C. Aust. ..... I have seen from New York (no Space F.D.) ---------- Mexico and Brazil (Bahia Salzmann) mixed with Micranthemum orbiculatum ! "

Of your Wrightiacis I ask you urgently, not to dispose of any. I thought, that the collector may have made his collections in duplicates and could be moved to let go of individuals through purchase or exchange As things stand now, it must be firmly expected, that

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the prior tests will be ended in not too distant time with the tearing away of the island. - I am well aquainted with the name and residence of your north-american nestor of bryology, and this is in everybody's mouth; I thought, that, may-be, somewhat younger generations would be found, to which belongs, also xxxx according to your news, Mr. Bolander..

Simultaneously with your letter I received one from Rio de Janeiro with much mixed Asolla, a Wolffia, which is very interesting to me, because I cannot, despite all efforts, distinguish it from our W. arrhiza. It has not a trace of pigmentation.

May I further ask you, to tell prof. Braun , besides a recommendation for me, - I shall write to him myself quite soon -, that Mr. A.Ernst in Caracas sent a letter with some of Wolffia Welwitschii, which he found there new, and which will hopefully spread from there..

The news is, that he will send to me in the next weeks in a case a bottle with this plant in spirits to the Berlin botanical Garden. This news is very glad for me. I had mailed a little sample of the plant to Ernst, as it had been collected already earlier in that area.

For today I greet you heartily, Your

F. Hegelmaier

Tübingen June 22,1869

(translated from German script by E. Denison, March 1989)

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Nov. 15 1870
Oct. 17

Manchester Friend

Replying to mine of the 15th ult
for the needful Information
about male & female Specimens
of Silene virginica, I am
sorry to say that I have not
been able to find any yet in
flower in the Woods around
Cincinnati (Ohio) and
vicinity, although I have
searched for them in the
proper season. Some Years
ago, I found a few plants
of S. virginica in flower
in the Woods of Mr. L. Perkins,
near Painesville, Ohio, but
I neglected to observe
whether they were male
or female plants, as
I was not aware, at
that time, of the
importance of such
observations. Mr. L. Perkins
will, undoubtedly, remember
the locality of the plants
and the Naturalists, who
may visit Painesville
during the next Summer
will find Mr. L. Perkins very
willing to show them the

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kann ansehen wird, ob dieselbe
mit ihrer Einfassung ihre Form
wechseln kann, wie es mir
scheint, nicht ganz
Wintersamen Pflanzen ist meine
Meinung, daß sie sich in ihre
verschiedenen Lagen
gleich in zweifache Art
Bruch. verwandeln. Ihre Form
scheint zu [illegible]
glücklicherweise sind sie
kleine Pflanzen und
diese Mark [illegible]
gesehen sein ist Vorsichtsmaß
angenommen obwohl [illegible]
abgeschlossen, ein kleines Bischof
Farbe, ohne es vor [illegible]
abschneiden, ist wohl [illegible]
in [illegible]
[illegible]

Heidelberg
26. Juni 1870.

ergebenster
A. Engelmann

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Hegelmaier
Rec. July 15, 1870
ans. Aug. 17

Tübingen, June 26,.1870

Most Honored Friend !

Receive my best thanks for the recent shipment, about which you may perhaps express an opinion; but this is not so easy, because the two in the related number (Florida lac. Canby) offer by themselves and with the Lemnae mixed with Azolla,, each by itself a little problem. - The one, larger one, fewer present form, belongs to the 3-merous and probably sterile, anyway with atropic seeds, L. group of perpusilla. To me it seems probable, that they are to be designated as perpusilla rather than L. paucicostata,, and that on account of several vegetative marks, primarly the condition of the wings on the root-disks, which, though present, are nevertheless very small, as I always found for L. perpusilla, whereas the other broader fits entirely according to the rules. But I do not want to base an apodictic (i.e. "finite" E.D.) diagnosis upon this nor other vegetative points,, and it would be of special interest to me, to get a point of reference,. specially from that territory,. from which I do not know with certainty neither the one nor the other of the questionable species..

The other, also sterile,, belongs into the exclusivly american,, from the United States to Patagonia spreading, group of forms with a 1-merous sprout. The members of this group are very many, and I received just during the last year an entire series for study, however all of them are known only as sterile with exception of the valdiviana, the fruiting form of which I am endebted to the Hon. Austin. I have forms as the present one (a very similar one I received once from you from the Union territory from New Mexico), since then designated in my and foreign collections as L. (valdiviana var.?) abbreviata,. because they are much shorter and relatively broader than the typical, and though one may meet with forms, with whom one is in doubt,. if they belong entirely to the latter or to abbreviata,, and, as on the other

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hand there are forms, which seem to construct a firm, continous line between the abbrevata and the shortest and smallest form: minima Philippi,, and as far as can be judged after examination of the process of vegetation..

You certainly must believe me,, that I recoyce every time I see your son, and that I regret only, that I can not be of more service to him (verbatim: "earn credits for him" E.D.). Such an industrious and exemplary studious young mam can introduce himself every place, where it may be desirable,, and needs no recommendation in the least,, he, who arrived from abroad and becomes an immediate price-winner (this is a fairly free translation of an involved compliment,, E.D.). I was, however, especially glad, to be able to congratulate him to his last success. I hope, that he will not look at his semesters here as lost ones. If these come to termination with the current one, seems not to be definitively decided. I, myself, cannot council for a continuation, because we deal with a winter semester, when it is dull here.

During the last Easter vacation I spent several weeks in London and made occasionaly some studies in the ..... collections. Some of this I can employ in the near future in the Flora Brasil. I do not have important findings in the latter field, only small specialities, which I took over for this job; besides this, an number of items arrived, but have not been developed nor completed. A small theme, however, which I mailed to you several weeks back, will be in your hands shortly.

Greeting you with highest esteem, Your most devoted

F. Hegelmaier

(translated from German script by E. Denison, April 1989)

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Ank. Okt 24 1870
Abg. Okt 26 1871

Zeug-Nr 29

Amerikanischer Frühling

Gestern in der Nähe Hannovers war
17. Aug. und heute so interessantes Früh-
lingswetter gehabt, daß ich mich mit der
Frau meines Kollegen Jung Braile-
mit Hunden ins Freie begab, um
die Frühlingsluft einzuatmen. Wir
waren noch nicht weit gegangen, als
wir Hasen in großer Anzahl vor uns
hoppeln sahen, und bald kamen
wir an Kaninchenlöcher, die
ganz frisch aufgeworfen waren.
Auch an die Fasanen hatten wir uns
mit Freuden erinnert, und sie waren
wirklich auch da, aber so scheu, daß
wir keine zu Gesicht bekamen.
Dann wir gingen noch einige Stunden
über Felder und Wiesen, bis wir wieder
in Hannover waren, wo wir gegen
6 Uhr Abends ankamen, also
12 Stunden draußen gewesen waren.
Ich habe mich sehr gefreut, daß
Frau Jung mit ihrem Kinde
Fritz, welches jetzt 2 Jahre alt ist,
Sonntag abend noch 2 Uhr 3 Minuten
Stunden. Die Kleinste ist allerliebst
und sehr gescheidt für ihr Alter,
Fritzchen natürlich ganz Hessisch und
spricht Hessisch und Hannöverisch
durcheinander. Sie ist sehr
Kindlich und sehr Kindisch.
Dann wir gehen Sonntag
über 6 Tagen wieder hier in
Hannover ab, um Mittwoch
12. Aug. Abends 8 Uhr in
Berlin, wo wir bis Freitag
Abend 8 Uhr bleiben, um
Freitag Abend 8 Uhr
Nachtzug
Nachmittag 2 Uhr 3 Minuten
Stunden. Die Kleinste ist allerliebst
und sehr gescheidt für ihr Alter,
Fritzchen natürlich ganz Hessisch und
spricht Hessisch und Hannöverisch
durcheinander. Sie ist sehr
Kindlich und sehr Kindisch.
Dann wir gehen Sonntag
über 6 Tagen wieder hier in
Hannover ab, um Mittwoch
12. Aug. Abends 8 Uhr in
Berlin, wo wir bis Freitag
Abend 8 Uhr bleiben, um
Freitag Abend 8 Uhr
Nachtzug

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Hegelmaier
Rec. Sept. 24, 1870
Ans. Oct. 26, 1871

Tubingen Sept. 3, 1870

Most Honored Friend !

I came yesterday into possession of your letter of Aug. 17 and its most interesting enclosure (it seems to be of the first order) ; I hurry, to thank you for both. I am very glad, to hear a few words from you after your son has left Tübingen since two weeks, as you will have heard from him directly, and, according to news from there, has moved to Kreuznach, the seat of a military hospital.

As to the Spirodela ,it is highly welcome, because it is not entirely new to me, but the present seeds will serve me well. About 6 days ago came a letter, dated Aug. 12 from Mr. Leggett from Funcha (??? E.D.), containing a number of flowering fronds, but only 2 Or 3 fruit, which can be examined. The smallness of the plantles is either entirely accidental or, more likely, is connected to their fertility. . . Negative is, that there is no difference to be found from our polyrrhiza. However, the most striking is not only - as Mr. Leggett already stated in the letter - that the fruits are one-seeded, but also, - I found this without exception on a number of flowers - that the ovary is uni-ovulate, it trends in its anatropism (to the very similar ovulum of gibba, the seed though positions itself ((as with gibba, when through a miss* it becomes one-seeded) through shrinking of the hilum and partum (??? E.D.) almost to the length-diameter of the fruit, where it comes to lie as in minor. As the proofs for ~~the~~ our polyrrhiza definitely come out for two, and as an observer as conscientious as Griffith has given a harmonizing picture, it seems to me already for that reason, that the form from New York must be considered at least as a new sub-species, if not species, even if other differences in the sphere of fruit formation sgould not exist, for which I cannot judge as I have ssen the old-world form only sterile. Equally, ~~er~~ we are naturally not capable to decide, if (which is not at all probable)

* Fehlschlagung' can mean anything that went wrong. E.D.
* the German

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Spirodela polyrrhiza of the new world, if they were fertile, would produce only one ovule, and, thus, belong to the present form. All that I wrote day before yesterday to Mr. Leggett, with the remark, that he would have to produce first a name for the novelty, or it could be dedicated to him, further with the request, he should let me have some material with seeds in alcohol spirits, or at least several seed bearing, dried fronds, because it would be of great interest, to examine the seeds more accurately and for this the supply was insufficient.

There is generally quite a problem with the seedbud number of these plants: I know since my visit to London a Lemna, of all places from New Holland (Australia, E.D.), which vegetatively is very similar to minor (also existing in New Holland), but has 2 ovules hemianatropous, i.e. it may form a connecting link to gibba.

You ask about the method for determining the venation. The process is as follows: After softening the fronds first in hot water, they are being bleached in alcohol in a covered porcelain dish, which goes the fastest, if one brings them still warm into alcohol absolutus, but common spirits will do. If it is desired to use later etching potassium then the alcohol must be eliminated first through washing. In some cases it is useful to mix the potassium with a light-blue color through a mixture of glycerin and chlorzinkjor (whatever that is, E.D.). Chlor - zinkjor alone is mostly too dark blue, for which application the potassium must first be washed out again. Specially the bleaching with alcohol has an excellent influence, and has the additional value, that it gives the soft plant parts a certain hardness, so that they can be cut well, as they cannot be cut without this. Through such expedients (alcohol, potassium, glycerin, chlorzink...) one can prepare parts of dried plants for the recognition of delicate morphological and even developmental conditions. You will see after the bleaching also the little

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starlets of the Call. austini and related forms, of course, they are not numerous and will have mostly a star of 4 or 8 cells, without difficulty, further stomata on plants, which had been dried. But enough ? I write under the influence of the capture of Napoleon yesterday and the army of MacMahon. The news arrived just now, and thus my hurry.. Six weeks ago I would not have believed, that I would again grab my bandage case, and yet, it has come to that now, as I am twice daily active in a reserve-hospital for wounded for several hours..

A short theme in the botanical newspaper you may perhaps receive by mail with this letter. Heartily greets you Your

F. Hegelmaier

(translated from German script by E.Denison, April 1989)

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Rec March 13 1871
Ans Oct 25

Zürich Febr 21 1871

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(1)

Hegelmaier
Rec.
Ans. oct. 25

Tübingen, Feb. 21 ,. 1871

Most Honored Friend

Your so often proven willingnes, permits me today to dare to make a request for material for a little study,, which does interest me much to make in the future. I would like to make some developmental studies of Azolla, first the developmental processes in the vertex of the stemr (with the development of the strange leaves, the branches, etc). For Salvinia we have in this regard a nice essay from Pringsheim, but of Azolla one knows, as far as I know, nothing.

For this I would need to get Azolla in alcohol. Don't you have an aquaintance in an area, in which A. caroliniana exists ? Sterile plants would work. I do not know, if A. produces spore capsules frequently in North-america; Should there be material, which would permit information about its development, this would be the better, but, as said, that is not my most urgent wish.. Considering the minuteness of the plant a small bottle would suffice. I am not in a hurry and would be entirely content to get to the matter during the winter 1871/72 Or 1872/73. During summer there is always enough alive material to be examined. Azolla is stated by A. Grey for (the state) New York, but if it exists in New York itself, I do not know. Otherwise I could have turned to a gentleman there under the circumstances. I received this winter from such a man freshly obtained material of Lemna Torreyi, unpressed in conserved condition; it had grown under water, and, in consequence of this I find very many sprouts of winter associated strength, hollow holes as the Hibernamela (?? E.D.) of Spirodela, and as it occurs similarly with Lemna gibba, overwintering sprouts, with wich I have since become aquainted.. What the meaning of this matter for L. Torreyi realy is, is not clear to me ((The translation of the last few lines m ay be correct or not,. the text is harly legible. E.D.))

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as several items do not seem to fit, that it would be possibly of the named No. 2. Some american about the matter I could probably publish sooner or later in connection with a future essay about the american Lemnae, which I consider a specifically american group, and which until now all exist in sterile state with exception of L. Torreyi (valdiviana), so that a separation of the forms will be difficult and perhaps only dubious. Material from North, Central and South America, and, I mean, the truly examined material, I possess in rather rich measure

About the seeds and 2∝ organs of Spirodela I have almost finished an essay, which through compilation of various matters became somewhat farreaching. and which I may be able to send to you in the not too distant future.

I have not heard anything from your son since I mailed him his price medal and received news of his arrival. I surmise thus, that he is well.

Concerning Azollo, I consider as certain the ability to execute my wish. If you could however do something without too much trouble, it would be a pleasure for me and I would be heartily obliged to you.

Your most devoted F. Hegelmaier

Tübingen Feb. 21,1871

(translated from German scipt by E.Denison, April 1989)

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Recd Febr 9
in April 69

Tübingen, 18. Jan. 1869

Hochgeehrter Herr

Ihr Brief ging mir im November v. J. zu und ich hoffe noch in den Ferien Ihnen ausführlich antworten zu können, gegenwärtig fehlt es mir aber an Zeit, da ich die Correcturbogen meiner Arbeit über Hydrodictyon zu lesen habe und mit dem Abschreiben der Figuren nicht fertig werden kann.

Auf Ihre verschiedenen Fragen will ich so gut mir möglich Antwort geben, doch bitte ich mir nicht übel zu nehmen, wenn ich Ihnen nicht ausführlich antworte, da ich augenblicklich sehr viel zu thun habe.

Die meisten Ihrer Fragen sind mir nicht genau bekannt, da ich in den letzten Jahren mich nicht viel mit Botanik beschäftigt habe, und ich es Ihnen überlassen muß, ob Sie meine Antworten brauchen können oder nicht.

Ihre Ansicht über die Entstehung der Zellkerne theile ich vollkommen, ich habe mich schon vor mehreren Jahren dahin ausgesprochen, daß

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George E

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Hegelmaier
Rec. Feb. 9
Ans. Apr. 19

Tübingen Jan. 18, 1872

Most admired Friend,

Your letter came to me in November of last year and is still in the hands of Hochstetter, to whom I transferred it on account of its contents, but I know ~~them~~ it sufficiently by heart, to be able to answer.

I thank you much for the various enclosures, and, according to your wishes, I have given one half of the spindles to Prof. Braun. I would not know what to add to you remarks about them. Your eastern Arceuthobium seems to be a most interesting plant.

During my last meeting with Hochstetter he told me, that he hoped, he could serve you with diverse items, and that he would send some himself soon. If this has happened in the meantime, I do not know. The collection of conifers in the local botanical garden is not really bad, but there are almost only newly planted, therefor young and still sterile specimens.

I am really now involved in morphological-histiological studies of our Lycopodia, a very difficult genus in this connection, because the growth processes are much more difficult to examine on account of the condition of the tissue than with other vascular cryptogames. The matter will, I expect, take still several months, without being able beforehand to envision, what positive results may result. The still unknown processes of reproduction of these plants will be almost impossible to penetrate, and I have not made so far any attempts in that direction. An inch long, or even shorter, stem section with leaves (dried) could be of much value to me sometime. But, I do not know, if you have it. What concerns Azolla (Salviniaceae, E.D.), I believe that living, fertile specimens would make a big (verbatim "fat") bite for a europaean morphologist; he would need incomparable material for an examination, for which I too would

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not be averse; but, as you know,, my wishes are so far modest ones.. I fear, that the plant, which is sterile with you, does not exist any more after its habitat has been dried out,. and that thus, I cannot get it from you any more.. May-be I will be successful in Melbourne,where I write for Azolla pienata (?? E.D.) (which belongs into another section than caroliniana). I do not like to let go of such a small project once I have got it into my head..

You write, that you did not receive the announced theme about Lemnae; of course, because it does not exist yet. But I will return to this subject without fail as soon as the nearest-lying has been pushed off.. For the cause itself it will only be of advantage, if it rests a little while, as from time to time contributions arrive, which can be evaluated . Thus I found recently a striking form from Brazil (belonging to abbreviata)with a few flowers,, the only ones so far besides the flowering Lemna Torryi; fruits I do not find.. I will have to write once more about this family, already because the geographical material has become much richer in the meantime,. and which must be combined from notations collected so far. Recently came also finally a Lemna from Buenos Aires, and most suprisingly gibba, with the remark by the sender, Prof. Burmeister, that this was the only form found in the lowlands there,. which may be questioned, The presence of flowers and half-ripe fruits with 3 - 4 embryonic seeds finally determine the identity of the americanr gibba with the europaeanr entirely.. - Strange is also a Lemna, discovered quite some time back by S. Kurz in Indonesia ~~East Asia~~, and, according to his message,quite rare there and since unknown (Lemna Kurz).. I sacrificed a few of the few received frondes for examination,and it seems, that finally a kind of joining link betweenr our so similar ~~tristutor (??? E.D.)~~ trisulca and other species; the ..... 4 ∝ ..... are ..... 1 - nerved,without

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stomata, but with entire walls; edge entirely ..sterile.... It is strange, that all these connecting members with their important forms , as also the .....4 β... oligorrhiza retreated to the far Southeast. Be heartily greeted, Your

F.Hegelmaier

(translated from German script by E. Denison, March 1989)

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Rec'd March 18th
Ans'd April 19

Tübingen, den 22 Febr. 1872

Hegelmaier

Hochwürdigster Herr Doctor!

Euer Hochwürden Hegelmaier'sche Schrift über Herrn Professor Hofmeister, seine Coniferen- Forschungen und seine Forschungsmethode habe ich mit Interesse gelesen. Der Aufschluß, den Sie mir darüber gaben, hat mich ganz befriedigt, und Sie können überzeugt sein, daß ich Ihren Wünschen gerne entsprechen werde. Ich bin aber auch Ihrer Meinung, daß man meine Forschungen nicht für vollständig halten darf. Ich habe nicht Gelegenheit gehabt, die Entwicklung der Geschlechtsorgane bei den Coniferen, wie sie Hofmeister beschrieben hat, zu untersuchen, und bin auch nicht im Besitze des Materials, das dazu nöthig ist. Ich habe mich auch bisher nicht besonders für die Entwicklung der Geschlechtsorgane interessirt, und mich mehr mit der Entwicklung des Embryo beschäftigt, da mir dieß mehr Aufschluß über die Verwandtschaft der Coniferen zu geben schien.

Der Hauptzweck meiner Untersuchungen war, die Verwandtschaft der Coniferen unter sich und mit den übrigen Gymnospermen festzustellen, und da mußte ich mich vorzüglich mit der Entwicklung des Embryo beschäftigen, weil diese mir die meisten Anhaltspunkte zu geben schien. Ich habe mich auch bemüht, die Entwicklung der Geschlechtsorgane, soweit es mir möglich war, zu verfolgen, und habe auch Einiges darüber gefunden, was aber noch sehr der Vervollständigung bedarf. Ich habe mich aber nicht damit begnügt, die Entwicklung der Geschlechtsorgane bei einer Species zu verfolgen, sondern habe mehrere Species untersucht, und zwar Repräsentanten aller Familien der Coniferen, mit Ausnahme der Taxineen, die mir nicht zu Gebote standen. Ich habe mich auch bemüht, die Entwicklung der Geschlechtsorgane bei den Gnetaceen zu verfolgen, und habe auch Einiges darüber gefunden, was aber noch sehr der Vervollständigung bedarf. Ich habe mich aber nicht damit begnügt, die Entwicklung der Geschlechtsorgane bei einer Species zu verfolgen, sondern habe mehrere Species untersucht, und zwar Repräsentanten aller Familien der Coniferen, mit Ausnahme der Taxineen, die mir nicht zu Gebote standen.

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Pinus pungens Michx.
" Milleri Michx.
" contorta Dougl.
" resinosa Sol.
" muricata Don.
" Fremontiana Endl.
" Alliottii Engelm.
" glabra —
" australis Michx.
" Taeda L.
" rigida Mill.
" virginiana Dougl.
" ponderosa Dougl.
" Sabiniana Dougl.
" Coulteri Don.
" tuberculata Don.
" radiata Don.
" brachyptera Wilkes.
" Engelmanni Carr.
" Jeffreyi Murr.
" monticola Dougl.
" Lambertiana Dougl.

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Abschrift des Herrn möglichst wörtlich wiederzugeben,
wenn auch der Sinn manchmal dunkel erscheint, da wörtlich
die Übersetzung schwierig ist, da manche Ausdrücke
der Ausdrucksweise unserer Vorfahren entnommen
sind und manche Formen
veraltet sind.

In der vorgenannten Absicht, bitte
ich den Herrn meine Worte
mit gnädigem Wohlwollen zu hören,
geruhet sich, zu jedem Gegenstande
mit Ihrer gewohnten Herablassung

[illegible]

W. Hochwohlgeboren

[illegible]

[illegible]

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Hochstetter
Rec. March 18
Ans.. April 19

Tübingen Febr. 22, 1872

Most Honored Sir Doctor !

Professor Hegelmaier told me recently to arrange an exchange of a collection of conifers. In the appendix you willfind an index, and I doubt, that there is anything, which you can use. But I am ready with pleasure to send you my entire collectiom, as I have many duplicates of all of them. The collection is on boards as per enclosed photograph,, and offers much teaching material for the better knowledge of the Conifers as the cones are with the branches..

As the study of Conifers is my hobby horse, and I prepared the collections for institutions of learning, I would be very much obliged,. if you would assist my efforts through completion of my collectiom.. It would be especially desirable to obtain of each Pinus species fine,, leaf-branches,each in 12 - 15 specimens, fully mature cones, each 25 - 30 with tightly closed cones (which do not open) Would it be withim your abaility and possibility to achieve such a shipment ??

I take the liberty to recommend the following list of desiderata to your kind consideration:

PINUS

pungens Michx	glabra	Sabiniana Dougl.
contorta Dougl.	australis Michx	Coulteri Don.
vesinosa Sol.	Taeda B	tuberculata Don
muricata Don	rigida Mill	radiata Don
Fremontiana Endl.	insignis Dougl	brachyfera Wisliz
Alliottii Engelm.	ponderosa Dougl.	Engelmanni Carr
Zeffreyi Murr	montiola Dougl	Lambertiana Dougl

If you would be able to provide all american Pinus,where so much darkness still exists,this would be a big service to Science,the more as I intend to prepare a second improved editiom of my Synopsis Coniferum,in order to correct many mistakes..

In the hope, that you will be able to fulfill my very extensive wishes I am prepared to take on any counter- service with pleasure.

With highest esteem, most devoted W. Hochstetter
Royal University Gardener

OVER →

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Tübingen d. 5 März 1896.

Rec'd Marz 29
Ans. d. C. 16 April ans May 21st

Verehrtester Freund

Sie haben mir schon so viele Freundlichkeiten erwiesen, dass ich mich nicht wundern könnte, wenn ich mich einmal wieder mit einer Frage oder Bitte an Ihre Gefälligkeit wende. Haben Sie nicht vielleicht ganz reife, mit ohne in Weingeist aufbewahrte Früchte von Eriocaulon bulbosum in Ihrem Herbar? und in Bezug darauf könnte ich Sie nicht um wenige (2–3) solche Früchte bitten?

Ich bin stark eine vergleichend-entwicklungsgeschichtliche Untersuchungen, zunächst um Arten der Entwicklung des pseudo-monocotylen Keims unseres Farnen Bulbophyllum (dessen gekommen) auch einige andere Monocotylen Keime zur Vergleichung heranzuziehen, und so kam ich auch an die obengenannte Pflanze. Ich habe von dieser Exemplare aus dem botanischen von St. Louis, mit Früchten, aber

Ordnung des systematischen Charakters
vortrefflich ausgebildet sind; aber für
meinen jetzigen Zweck sind sie nicht
reif genug. Die Umbellaten-Embryonen
erweisen, wie es scheint ihre Ausbildung
zum Theil ganz ungemein spät, erst in
der überreifen Frucht, wo die Embryonen
schon ein ausgetrocknetes und festes Gewebe
bilden, sollten sie also nicht eher früher
besitzen sie der obigen Bedingung in Bezug
auf Reifezustand entsprechen, so habe
ich bis jetzt mir solche nicht zu wählen.

Ich hoffe, in nicht allzu ferner Zeit wieder
etwas mehr von mir hören lassen zu können.
Die Exkursionen sind gut ausgefallen;
die Ausbeuten nicht gering. Hier und
da manches Andere nun wieder in
die Reihe kommen. Die Botanik ist ja
jetzt mehr als jemals eine Lust die
Formentheile einmal 4 Wochen und
von Tage zu Tage studirt werden muß
anscheinend recht einförmig, den
damit Beschäftigten aber ein neues
bietend, — so Manches was in Thorn

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George sucht seinen Dissertations-
ver seit seiner Rückkehr angefangen
hatte ist in der That Alles so in
diesem Stück seither in Ordnung gekommen.
ist. Er hat sogar mit Doctor Blume
ist somit in den letzten Jahren
hier zusammen gewesen; ich habe
aber z. Th. versprochen Alles zu liefern,
was es geben wird. Wir erwarten
doch einmal wieder einen Blick
auf Ihr liebes Heim verspricht
spricht es sich für unmöglich
ist speciell schwierige Verhältnisse,
ungemein viel hier reindert stören
di med. Facultät zu Hülfe zu eilen!
Jemand studirende Eingänge!
auf in meine Angelegenheit
ist Vorzüglichen anerkennen.
Andrew bitte ich verbleiben Sie mir
meine Bitte nicht, mögen Sie nun
dieselbe erfüllen können oder nicht,
mit herzlichen Grüssen

Ihr

ergebenster

F. Hegelmaier.

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Rec. March 29
Ans. P.C. April16,Letter May 21

Tübingen, March 6,1876

Most honored Friend,

You have done for me already so many kindnesses,that I should hardly dare, to approach you with another question or request for your kindness..Do you have perhaps entirely ripe, with possibly im- 1α Mericarpien ..... dissolving fruits of Erigenia bulbosa in your herba- rium ? If th s is the case, may I ask you,to send me a few (2 or 3) of such fruits ?

I am working on a comparative embryological investigation of the kinds of development of pseudo-monocotyledon sprouts of our 2-1β Carum Bulbrichteum (???? E.D.),bringing several other Umbelliferae into comparison,and thus came to the above-named plant. I have of this specimens from the area of St.Louis,with fruits, which,which are excellently developed for the recognition of the systematic characters,.but are not ripe enough for my present purposes..Embryos of Umbellatae reach their development in part, as it seems, unbelievably late, only in the overripe fruit,where the endosperms form already an ovopartes (?? E.D.) and firm tissue..If you should not possess fruits, which fulfill the above conditions concerning the status of maturity, I ask you, not to send them to me.

I hope, to let you hear from me in the not too distant fu- 2α ture.Your Echinocacti ..... did grow on well and the Aroideae ..... are not 2β forgotten. These and much elsewill get attention in due order. Botany is now, more than ever,.a matter proven to a major part, and is being studied by work processes boring and very uniform,though offering to the person applying himself constantly something new..

The little/of dissertation, which I sent to your Georgi which appeared here since his return,, is, in fact, all, that has come to the light since..The request for doctor diplomas has thus been weak during the last years; But I did

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promise to deliver all that will be produced. If he would look now again at Tübingen he would see much changed, considering the easy and .Specially... swabian situations; the medical faculty has been renewed by one half; garrison and "one-yearlings" (see explanation below, E.D.) ! And in my own environment and family some things have changed. Now, please do not hold my request against me, regardless if you can or cannot fulfill the same.

With hearty greetings, Your F. Hegelmaier

"one-yearlings" or "one-year-ones" are students from schools of higher education, (Gymnasium or Realgymnasium), who at age 14 to 15 passed a physical and mental examination, which entitles them to serve only one year in the armed forces (instead of 3), and who have the right to choose their army affiliation. The full German term is "Einjährig Freiwilliger." E.D.

(translated from roman script German by Edgar Denison, March 1989)

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Rec July 31
Ans Febr 10 1878

Tübingen 12 Juli 1878.

Embryo of Erigenia

Verehrtester Freund

Ich hätte Ihnen schon seit Wochen für die gefälligst erhaltenen Erigenia-Früchte danken sollen, deren gütige Besorgung Ihnen ja doch einige Umstände gemacht hat. Die Notiz über ihren Empfang vergassen Sie leider. Die Untersuchung derselben hat allerdings ein auffallendes Resultat ergeben, nicht ganz so wie es mir a priori vorschwebte (ich hatte nämlich an eine pseudomonocotyle Bildung des Embryo, ähnlich wie bei Ficaria, Batrachium, aber fast vor allem Selbst die reifsten jener Früchte nämlich (also wie sie vom Boden aufgelesen) jenen Zeigen der Embryo noch in keinster Art entwickelt, erst über die ersten Stadien der Proembryo-Bildung hinaus vorgeschritten, und aus diesem sind in dem schon ein vorgerücktes Gewebe bildenden Endosperm überhaupt nicht ohne Schwierigkeit, und nur in der Minderzahl der Samen aufzufinden. Es sind Bildungen etwa

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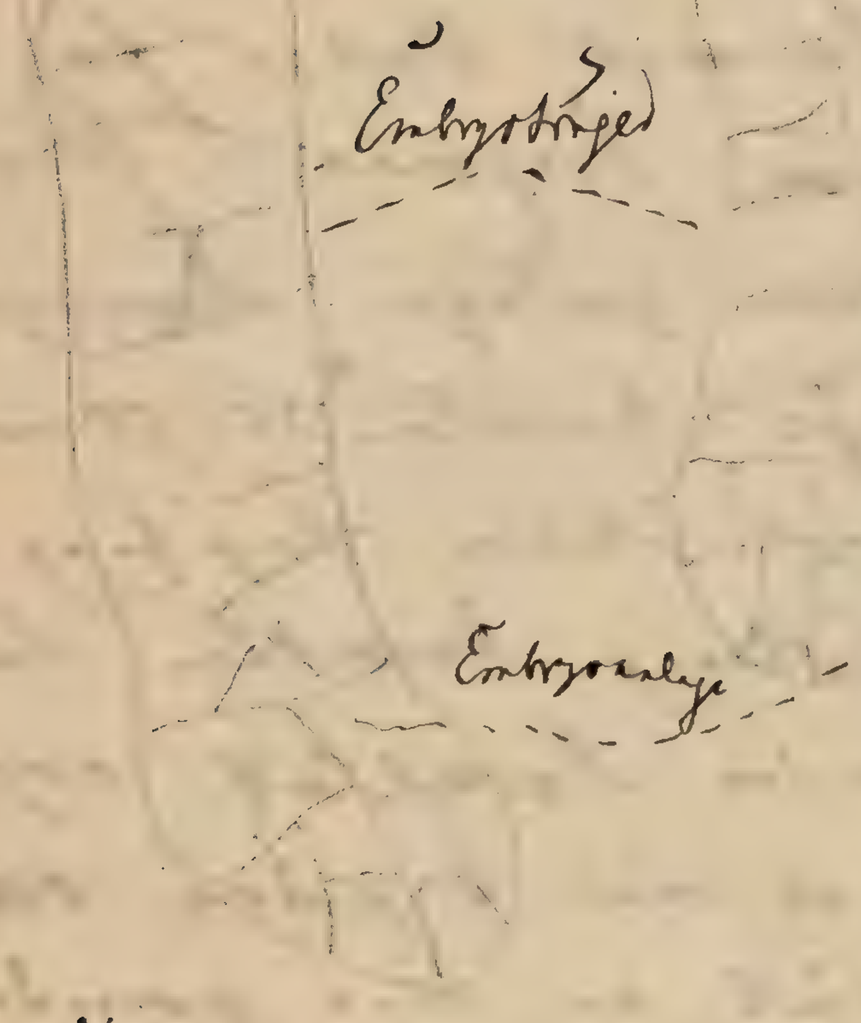
Ur Herr Art,



Es müssen die folgenden Erörterungen entnommen werden aus dem Selbststudium der früheren Werke,

Schließlich Dinge können ja bei verschiedenen Phanerogamen namentlich größeren Schwierigkeiten (vor) bei Umbelliferen kann nur sie sich nicht;

Ich hoffe diese Arbeit eine kleine Serie weiterer embryologischer Studien zu Publikationen fertig zu bringen,

Wird Ihr Sohn wohl glauben so viel Arbeit hinein Zeit hier aber 6000 Studierende haben Preise nicht materiell viel

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Herrn Prof. Dr. Wiesner nebst Frau Gattin u. Theodor
und den man für nächstes Jahr zu
die Universität ihr hoffentlich
Festlichem feiern will auf auch fröhlichen
Tag rechnet? Nachher wird ihm
wohl der Rückweg nicht zu
schwer bleiben. Für sein freundliches
Zeilen besten Dank! Allen ist wohl
und lässt ihn grüßen. Wir bleiben
in dankbarer Ergebenheit

Ihr

T. Engelmann.

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Hegelmaier
Rec. July 31
Ans. Feb.10,1878

Tubingen July 12,1876*

* the 6 could just as well be an 8 ? E.D..

Most Honored Friend

I should have thanked you weeks ago for the happily received Eriginea fruits ,who'se procurement brought you some trouble. The examination, made shortly after receipt,resulted however in remarkable results, not quite, as I had imagined a priori (in to-to that is as a pseudomonorotil formation of the embryo, similar as with \α Belbriastanum) but almost even stranger. Even the ripest of the fruits(that is , those most likely gathered from the ground)) show the embryo undeveloped in the highest degree,only past the first stages of the proembryo - formation progressed,and for that reason not to be found without difficulty in the ovopartes tissue forming endosperm, and only in the minority of the sseds. There are formations of this kind::

see drawings on original letter

The following development must be passed through after the self-sowing of the seeds..

Similar things occur with different phanerogames,specially certain 2α ,but of Umbeliferae one does not know them. I hope to get a small series of such embryonic studies ready for publication this fall.

Will Georg believe, that we have this summer over 6,000 students (of course,not specially many in medicine,more in Law and Theology),and that next year the university will celebrate its 400th anniversary, and figures on a large increase ? Later, the reaction will probably not fail. Fot his friendly lines my best thanks. All are well and send their greetings. As always in grateful devoteness, Your

F. Hegelmaier

(translated from German script by E . Denison, April 1989))

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Rec'd April 2d
Ans. Feb 12 1880
——— April 29 1880

Tübingen 11. März 1828.

Verehrtester Freund

Ich bin nun seit etlichen Wochen in Besitz Ihrer Mittheilungen von 10. v. M., für welche ich sowohl für Brief mit Einschlüssen wie für Ihr Andenken ergebenst danke. Ich weiss indess nicht wie sie mein Kontor in meiner Abwesenheit erreicht haben, im Gegentheil habe ich schon lange nichts von mir vernehmen lassen, da ich in den Arbeiten über innere Verhältnisse mehrfach unterbrochen werde, die ich nie gänzlich abschliesse, bevor ich die Tafeln für eine Lieferung beisammen habe, welche ich, falls die Publikation nicht vorher gehemmt wird, bis Ostern herbei zu schaffen bekommen sollte. Es ist ja auch mit bekannt, wie die Entwickelung mitunter bis zur Tauerreife sehr weit fortschreitet um erst später wieder aufgenommen zu

Der einzige Parasit bisher der reife Früchte und uns nur ein paar Zellen, anderemal bekannt er verzichtet da Rotzpilzchen erst in ungefähren Form bei der Keimung es ist also nichts auffallend da. Über Ihren Erfolg etwas Befriedigtes vorkommt — — — Ich Ihnen mit 2 Muster von Lemnaceen gerichtet, da eine von Mexico enthält die in dort wo vielfach vorliegende Formen innerhalb viel Treffer gleichen, der aus Florida (Gainesville Nov. 77) ist für die Flora der Vereinigten Staaten interessant der er enthält überfalls Treffer gleichen, die zuletzt aus der Umgebung der Stadt Mexico bekannt war (viel, Ihr werden die grünen schmalen Bänder ohne Aufreißen fast mit bloßem Auge sehen, anderen allerdings Lemna polyrrhiza widersinnig und nicht. Die Pigmentierung der Epidermis ist bei der Treffer von letzteren sehr stark, die Unterseite ist

sie aber mit der von Mexico völlig identisch.
Wenn sie mir irgend einen Dienst dem
können so Ihre Güte zugehen zu werde
ich Ihnen allerdings für freundliche
Bemühungen höchst dankbar sein.

Brues wiederholt mehrfach Angaben, es
sei monatelang krank und tief in
schulden, so hat in seinem letzten
Lebensjahr noch bösartige Angriffe und
Verkleinerungen zu erfahren gehabt, aber
auch an schöner Anerkennung hat es ihm
nicht in letzter Zeit nicht gefehlt,
Erstaunt wird er in Berlin nicht werden
von beiden Nachfolgern Ausdrucken sie sich
gütigst dort in die Botanik zu theilen,
haben werden, so tüchtig sie auch
sind, Gelehrte wie diesen universel-
len Charakter sind ja in unserer
Zeit immer schwieriger aufzutreiben.

Bitte grüßen Sie Georgi von uns
aufs Herzlichste; bei Ihnen hier nun
ja einen Koffer, den man ihm auch
einmal in Europa zu sehen bekommt,
Nochmals herzlich danken und
Ihr
ergebenster
F. Hegelmaier

MISSOURI BOTANICAL GARDEN
ENGELMANN PAPERS

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Rec. April 2
Ans. Feb.12,1880
Apr.11,1880

Tubingem, March 11,1878

Most Honored Friend

I am since several weeks in possesion of your communications of the 10th of the preceding month, for which I thank most devotedly, as well as for the letter with enclosures and the printed matter. I do not understand however, how you could think to be owing to me, rather, I did not let hear of myself for along time, as my efforts have been interrupted several times through exterior circumstances; I am just now occupied,to prepare the illustrations for a series of embryological examinations, which you will receive during next fall ,, if the publication takes place.. It is generally known, that the development of the embryo has progressed very little by the time of seed maturatiom, and starts again only later. With a few varieties there exists a mature embryo. First from only a few cells, in other cases it develops at least into the cotyledon,in seeds, that have fallen,, or during germinatiom it is not quite apparent, as happens somewhat similarly with your Erigenia. -- You sent me two samples of Lemnaceae,. The one contains the frequently found forms from there,specially much Wolffia gladiata ; That from Florida (Gainesville Nov. !77) is of interest for the Flora of the United States,because it too contains Wolffia gladiata,, which, up to now,was only known from the environment of Mexico City (much,, you will be able to see the green,narrow bands without dissecting with the bare eye);. besides however Lemna polyrrhiza,valdiviana and minor.. Pigmentation of the epidermis is entirely with the Wolffia of the latter kind,otherwise it is ~~xexyxxtxexxky~~ identical with that from Mexico..

If, in any future, you get the time to deal with your treasures,. I would be most obliged for a friendly consideration..

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Braun's unexpected passing away 11 months ago,did deeply shock me. He experienced in his last years of his life some malicious attacks and detractions, but he also did not miss fine appreciation recently. He will not be replaced in Berlin by both successors,who now will have to divide the botany; regardless, how good they are,. it becomes ever more difficult to find scholars of such universal character..

Please greet Georg from me; with him one can always maintain the hope, that he will arrive in Europe some day. Again, thanking most ~~ha~~ cordially, Your devoted

F . Hegelmaier

(translated from German script by E . Denison, March 1989)

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Tübingen d. 2 Nov 1880.

Rec 2/Nov. 20'
Ans Dec 16

Verehrtester Freund

Von dem Empfang Ihrer gütigen Einsendungen habe ich Ihnen wohl schon Nachricht gegeben; die Arbeit über Pinus hat mir Gelegenheit zu einem ziemlich ausführlichen Referat in einer unserer forstlichen Zeitschriften, welches demnächst gedruckt werden wird wofern es nicht schon geschehen ist, Eigentlich habe ich mir Ihnen heute mit einer Bitte an eine kleine Notiz die Sie mir wohl ohne große Mühe werden verschaffen können, Sie kennen sicherlich den dort ansässigen — oder ansässig gewesenen — Herrn Eggert,

dieses Werk von welchem ich im
Laufe der letzten Jahre meines Aufenthaltes
an - wie es scheint recht bestimmten -
Pflanzen aus der Missouri - Flora
erworben hatte. Derselbe offerirte mir
nun in letzten Frühjahr eine Collection
von 400 Oregon - Pflanzen, deren
Catalog Gates versprach zu einem ver-
hältnißmäßig billigen Preis. Ich ent-
schloß mich dazu, den in Abrechnung
dieser Pflanzen sein volles von denselben
den gewöhnlichen Anforderungen an
Herbariums pflanzen in Beziehung auf
instructive Beschaffenheit entsprechen
würden, was ich seinem Ruf gemäß erwar-
tete.

Seither fehlt es mir aber an jeder
Notiz über diese Sache; Gray hat
nichts mehr hören, und Wellcott ist

er von St. Louis weggekogen. Es
wäre mir aber wünschenswerth zu
wissen ob jene Collection für mich
gemacht ist, oder nicht. Es wäre
mir Beides recht sein; im ersten
Fall könte ich auf die Zusendung
warten bis zu glücklicher Gelegen-
heit; im andern könte ich allen-
falls von hier, gelegentlich
zu einer andern Erwerbung zu
schreiten. Aber Nachricht wäre
ist haben

Falls aber Eggert noch hier wäre,
würde ich ihn bitten, ihn zu Abgabe
einer bezüglichen Notiz zu bewegen,
würde in diesem Brief an ihn selbst
dichten so würde er in Anbetracht der
vielleicht.
obigen Möglichkeit (der nicht zu

seine Steine gelangen und ich auch
unbestimmt lange im Magazines
bleiben.
Indem ich Sie also um Entschuldigung
bitte, bis ich mir Sie mit diesen persönlichen
Zeilen schriftlich erlaube ich mir die
Hoffnung auszusprechen, dass die Wunden,
die Ihnen die letzten Jahre geschlagen
hatten, zu vernarben fortgefahren
haben, und bin mit freundl. Gruss auch
an Ihren Sohn
Ihr
ergebenster
F Kegelmeier.

Bitte sagen Sie Georg, dass es bei mir gut
stehe; Ernst fängt mit diesem Semester
an Jus zu studiren, Theckla ist vor
Kurzem aus einer französischen Pension
nach Hause zurückgekehrt worden.

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

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Tübingen, Nov. 1, 1880

Most Honored Friend

I probably gave already notice to you about the receipt of your shipments. The dissertation about Pinus gave me the opportunity of a rather extensive reference in one of our forestry publications, which should be printed right away unless this has not been done already. Actually I appraoch you today with the request of a small note, which you may be able to provide without much trouble. You, surely, know the Mr. Eggert, who lives there or has lived there, from whom I obtained in the recent years all kinds of nice plants of the Missouri Flora - as it seems, properly identified. He offered me last spring a collection of 400 Oregon plants, who'se catalog was promised by Gates, at a relatively low price. I answered him then, that I wanted to aquire these plants, if they would meet normal standards of herbarium specimens in relation to instructive conditions, which I would leave to his judgement. Since then, I have no communication in this matter. Eggert does not let hear of him, and, may-be, he moved from St. Louis. I would like to know, if this collection was taken along or not. Either would be all right; in one case I could wait for shipment until the occasoin offers itself; in the other case I could consider to think certainly of another acquisition. But, I should have news. But, incase Eggert should still be there, I would ask you, to motivate him to a related notification. Should I addtess this letter to him in person, it may, in view of the above possibilities, not reach him at all, and I would remain in the dark for an indefinite time.

In any case, I ask your pardon, to have burdened you with this personal matter, and permit myself to express the hope, that the afflicted wounds, which the last years ~~hit~~ you, continue to heal, and remain with friendly greetings to your son, Your devoted

F. Hegelmaier

see pg. 2

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Please tell George that I am well; Ernst startes with this semester to study jurisprudence; Thekla has recently been brought back from a French pension.

(translated from German script by E. Denison, March 1989)